

# By Design

SUSTAINABLE DESIGN 2024



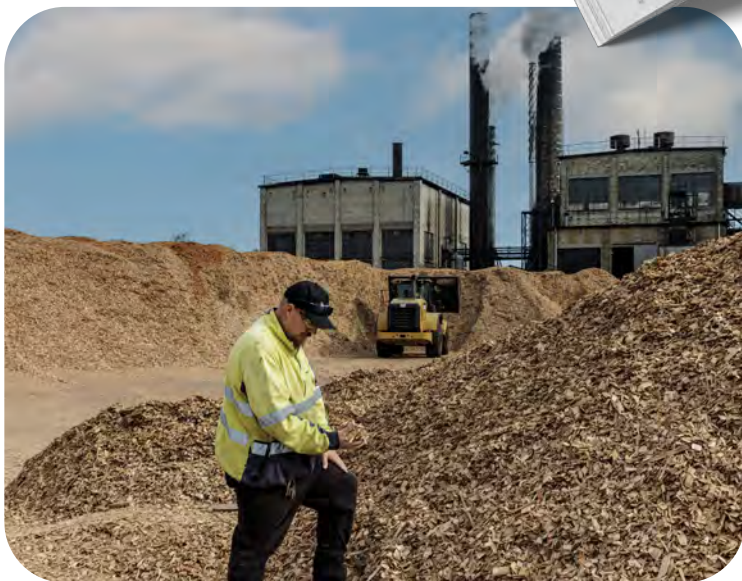
ISSUE 12 | DECEMBER 2024

# Introducing our **SUSTAINABILITY REPORT 2024/25**

We're thrilled to announce the release of our 2024/25 Sustainability Report, highlighting Weathertex ongoing dedication to sustainability and the future of the construction industry.



Scan QR code to read online or order a hardcopy.



**FREE ONLINE sample service.**

Simply go to [weathertex.com.au](http://weathertex.com.au) for cladding you can trust, *naturally.*

Weathergroove 75 Natural (stained)



## LEADING THE WAY, SUSTAINABLY



### Weathertex Natural range is Global GreenTag **PLATINUM** certified!

Weathertex was the first manufacturer globally to receive a Platinum LCARate™ and first in the cladding category to receive Platinum HEALTH HealthRATE™ certification from Global GreenTag for Weathertex's Natural Range.



**FREE ONLINE sample service.**

Simply go to [weathertex.com.au](http://weathertex.com.au) for cladding you can trust, *naturally.*

# GET ACCREDITED

Through the BDAA Today



[bdaa.com.au](http://bdaa.com.au)



## Become an Accredited Building Designer

### Why Accreditation Matters for Building Designers

In today's regulated building industry, achieving full accreditation isn't just a milestone – it's a necessity. Accreditation empowers building designers to align with the latest laws, codes, and best practices, ensuring they remain competitive in a challenging built environment.

The Building Designers Association of Australia (BDAA) is dedicated to supporting building designers on this journey by streamlining the accreditation process. We've modernised our systems, removed outdated documents, and refined the application process to make accreditation simpler, faster, and more accessible than ever.

### What Does Accreditation Mean for You?

Accreditation is more than a title – it's a formal recognition of your expertise, issued by state or federal authorities. It demonstrates your ability to meet industry standards and deliver exceptional results for your clients. In Tasmania, Queensland, and Victoria, building designers are required to be licensed or registered to comply with state-specific regulations. Accreditation provides the proof of competency and quality that both regulators and clients demand.

### Accreditation Is a Mark of Excellence

For building designers, accreditation isn't just about compliance; it's about earning the trust of your clients. It assures them that their projects are in the hands of a skilled professional who is committed to delivering outstanding results. Every accredited building designer helps raise the bar for the industry, guaranteeing the quality of homes and businesses across Australia.

---

# Editor's Note

Welcome to this special edition of By Design magazine, where we explore the critical theme of sustainability, a concept that sits at the heart of every innovative and forward-thinking designer's toolkit.

In this issue, we spotlight transformative approaches that are redefining our industry. Dive into "Adaptive Reuse of Heritage Buildings", where history meets sustainability, as we uncover strategies for preserving architectural integrity while achieving energy efficiency. Likewise, "Circular Design in Architecture" highlights how life-cycle planning can reduce waste and create buildings that endure.

We also showcase emerging technologies with articles such as "Hydrothermal Energy Systems in Residential Developments" and "Beyond Solar: Alternative Renewable Energy Sources for Residential Projects." These pieces provide practical insights into energy systems that are shaping the future of resilient design.

For those seeking tangible solutions, don't miss "Sustainable Facade Systems" and "Eco-Insulation", where innovative materials meet performance. And as cities grow hotter, "The Role of Green Roofs and Vertical Gardens in Urban Heat Mitigation" serves as an inspiring case for integrating greenery into our urban landscapes.

At By Design, we believe sustainability isn't a trend - it's our responsibility. The pages ahead reflect both the challenges and opportunities of building for tomorrow, with stories that will inspire, educate, and empower you to lead the charge for a more sustainable built environment.

Thank you for joining us on this journey toward design that doesn't just stand the test of time but gives back to the world.

Together, let's design the future.



TABLE OF CONTENT

- 5 Editor's Note
- 8 Earth One
- 12 Building a Greener Future
- 14 Modular Elegance
- 18 Global Green Tag
- 22 Adaptive Reuse of Heritage Buildings
- 26 Circular Design in Architecture
- 30 Building for a Hotter Future
- 32 Urban Heat Mitigation
- 36 Redefining Timber
- 38 Deconstruction vs. Demolition
- 42 Commitment to Sustainability
- 44 Beyond Solar Panels
- 48 Green Challenge
- 50 Sustainability at Weathertex
- 54 Adapting to Change
- 56 Our Sustainable Journey So Far
- 58 Step Into Sustainability
- 62 The Power of Pre-Construction
- 64 James Hardie, Proudly Australian Made
- 66 The Cool Factor
- 68 Smart Buildings, Smarter Energy Use
- 74 Understanding the Thermal Envelope
- 76 Paving the Way for ESG Excellence
- 78 Sunflower House
- 82 Building a Sustainable Future
- 86 The Future of Assisted Living
- 92 Passive Roof Ventilation
- 96 Whole-of-Home Energy Efficiency Ratings
- 98 A Commitment to Sustainable Excellence

# Find the inspiration

All the information needed to create your own winning designs in By Design



# Earth One

A PINNACLE OF SUSTAINABLE DESIGN EXCELLENCE

As the recipient of the prestigious Chris Reardon Sustainability Award, Earth One embodies a harmonious blend of cutting-edge sustainability principles and functional design, challenging conventional notions of what an eco-home can achieve. Its recognition is not only a testament to its architectural innovation but also to its alignment with evolving demands for sustainable living solutions.

Martin Freney - Earth One



Drawing inspiration from the Earthship concept pioneered by Michael Reynolds, Earth One refines this vision, tailoring it for the Australian context. The project not only reduces its environmental footprint but also provides a replicable model for sustainable residential architecture.

## The Earthship Influence: Learning from the Past

Martin Freney's 2014 Ph.D. thesis, *Earthship Architecture: Post-Occupancy Evaluation, Thermal Performance, and Life Cycle Assessment*, provides a critical foundation for understanding Earth One's success. Freney's research underscores the importance of life cycle analysis (LCA) and thermal performance studies in optimizing sustainable building designs.

○ The project not only reduces its environmental footprint but also provides a replicable model for sustainable residential architecture.



Martin Freney - Earth One

Key takeaways from Freney's work:

- **Thermal Comfort Without Active Systems:** Earthships, including Earth One, achieve remarkable indoor climate stability through passive solar design and thermal mass.
- **Material Reuse:** Tyres, earth, and recycled materials are used extensively, reflecting an ethos of resourcefulness and environmental responsibility.
- **Low Environmental Impact:** By leveraging passive systems and renewable energy, Earthships significantly outperform conventional homes in terms of energy efficiency and reduced carbon emissions.

Earth One elevates these principles further, tailoring them to meet the unique challenges of Australia's climate and building codes.

## Earth One's Innovations

1. **Climate-Responsive Design**  
Earth One is optimized for Australian conditions, incorporating advanced passive solar techniques. Its orientation, thermal mass walls, and insulated green roof are fine-tuned to harness and store energy from the sun, ensuring year-round comfort without reliance on mechanical heating or cooling.
2. **Advanced Water Management**  
Drawing from Earthship water systems, Earth One includes rainwater harvesting, greywater recycling, and efficient wastewater treatment. These systems ensure sustainable water use while maintaining a self-sufficient household ecosystem.
3. **Material Selection and Innovation**  
Earth One reimagines construction materials by incorporating:
  - Locally sourced earth for its rammed earth walls, reducing embodied energy.
  - Recycled components, such as reclaimed wood and bricks, to minimize waste.
  - Advanced glazing systems to enhance natural light and reduce thermal losses.
4. **Integration with Australian Standards**  
While Earthships are often critiqued for not aligning with local building regulations, Earth One bridges this gap by adhering to Australian standards, demonstrating that innovative sustainability can coexist with regulatory compliance.



Martin Freney - Earth One

### Social Impact:

The project has served as an educational hub, hosting tours and workshops to inspire the next generation of designers and homeowners.

## Key Learnings from Earth One's Thermal Performance

Freney's thesis highlights the critical role of thermal performance studies, which Earth One has successfully adapted. The use of thermal mass and insulated walls ensures minimal heat loss in winter and reduced heat gain in summer. These strategies significantly lower energy requirements, allowing the home to approach net-zero energy usage for heating and cooling.

Performance Metrics:

- Indoor temperatures remain within the comfort range for over 90% of the year.
- Solar panels and battery storage systems provide more than 80% of the home's energy needs, further reducing reliance on the grid.

## Beyond Sustainability: A Holistic Approach

Earth One's impact extends beyond technical performance. It challenges its occupants to engage in a more mindful and sustainable way of living. Its integration of food production systems—modeled after Earthship greenhouses—enables residents to grow their own vegetables and herbs, reducing food miles and promoting a circular economy.

## Paving the Way for Future Developments

Earth One sets a benchmark for future sustainable housing projects in Australia. It demonstrates that:

- **Sustainability and Style Can Coexist:** Earth One's aesthetics blend harmoniously with its environmental features, appealing to both eco-conscious and design-savvy audiences.
- **Adaptation is Key:** By localizing global ideas like the Earthship, the project proves that sustainability is not a one-size-fits-all approach but requires sensitivity to context.
- **Awards Matter:** Recognition through accolades like the Chris Reardon Sustainability Award amplifies the importance of innovative projects, encouraging broader adoption.

## A Legacy of Green Innovation

Earth One is not merely a home—it is a movement, an inspiration, and a call to action for a more sustainable future. By combining the lessons of Earthship architecture with cutting-edge research and localized solutions, it redefines what is possible in sustainable design. As the spotlight shines on this remarkable project, Earth One reminds us that the journey toward sustainability is one of creativity, resilience, and hope.

# Building a Greener Future

A quiet revolution is taking root in the construction industry. Hempcrete, a bio-composite material that marries the humble hemp plant with lime, is reshaping how we think about sustainable building. This innovative material isn't just a fleeting trend; it's a robust solution to the environmental challenges facing modern construction.

Imagine walls that breathe, regulating humidity and temperature with the effortless efficiency of a living organism. That's the magic of hempcrete. Composed of hemp hurds—the woody core of the industrial hemp plant—mixed with a lime-based binder and water, hempcrete creates structures that are not just buildings, but living, breathing entities.

The thermal properties of hempcrete are nothing short of remarkable. With an R-value of up to 4.2 at 250mm thickness, it outperforms many traditional insulation materials. This means cooler interiors during scorching Australian summers and warmer spaces in winter, all while reducing energy consumption. But the benefits don't stop there. Hempcrete also boasts impressive acoustic absorption, making it an ideal choice for urban dwellings where peace and quiet are at a premium.

One of the most compelling aspects of hempcrete is its environmental footprint—or rather, its lack thereof. In a world grappling with climate change, hempcrete stands out as a carbon-negative material. Each cubic metre of hempcrete sequesters a staggering 150kg of CO<sub>2</sub>, effectively turning buildings into carbon sinks. It's a building material that doesn't just reduce harm; it actively benefits the planet.

○ **The versatility of hempcrete is opening up** new possibilities for building designers.

Fire resistance is another feather in hempcrete's cap. With a fire rating of 60/60/60 and the potential to achieve 120/120/120, it offers peace of mind in a country all too familiar with the threat of bushfires. Add to this its natural resistance to pests and mould, and you have a material that's not just eco-friendly but also durable and safe.

The versatility of hempcrete is opening up new possibilities for building designers and architects. From wall construction to insulation, flooring, and even roof insulation, hempcrete is proving its worth across a range of applications. The Hemp House in Mullumbimby, NSW, designed by Barefoot Sustainable Design, stands as a testament to hempcrete's potential. With its 300mm-thick hempcrete walls, this home showcases how sustainable materials can create spaces that are both beautiful and environmentally responsible.



But it's not just residential projects that are embracing hempcrete. The University of Tasmania's Forestry Building is set to become Australia's largest commercial use of hempcrete, incorporating over 200 cubic meters of the material. This project is particularly significant as it achieved commercial fire rating, paving the way for wider adoption in larger-scale constructions.

As we look to the future, the prospects for hempcrete are bright. Ongoing research and development are exploring new applications, including prefabricated hempcrete blocks and even 3D-printed structures. The growing interest in sustainable building materials, coupled with evolving regulations and strengthening supply chains, suggests that hempcrete is poised to transition from a niche solution to a mainstream building material.

For Australian building designers, hempcrete offers an opportunity to be at the forefront of sustainable construction. It's a chance to create structures that not only meet the highest standards of design and functionality but also contribute positively to the environment. As we face the challenges of climate change and resource scarcity, hempcrete stands as a beacon of innovation—a material that builds not just walls, but a greener, more sustainable future for all.

# Modular Elegance

MEETS CUTTING-EDGE EFFICIENCY: THE EDEN 20

In the rolling hills of Victoria, a striking modular barn home stands as a testament to the seamless fusion of innovative design and sustainability. The Eden 20, crafted by Swanbuild, is not just a visual marvel, it's a beacon of energy efficiency, boasting an impressive 8.1-star rating that surpasses upcoming national standards.

## Design Ingenuity

The Eden 20's design is a masterclass in form meeting function. Its modern barn aesthetic, characterised by clean lines and a floating appearance, belies a sophisticated approach to sustainable living. The structure's orientation—east-facing for morning light, with its longer axis stretching north—maximises natural solar gain, a crucial element in passive design strategies.

## Material Innovation

At the heart of the Eden 20's performance is its innovative walling system. This includes an insulated 90mm frame combined with foam panels, Hardie™ Wrap Weather Barrier, and a cavity system using James Hardie's battened installation method. The exterior is clad in Hardie™ Oblique™ Cladding, a material choice that marries durability with aesthetic appeal.



This composite system achieves an outstanding R-value of 5.2, setting a new benchmark for modular construction. The cladding's clean, vertical lines not only contribute to the barn's contemporary look but also enhance moisture management and termite resistance.

## Thermal Performance

The thermal design of Eden 20 is comprehensive:

- **Underfloor:** R5.0 insulation
- **Ceiling:** R7.0 insulation
- **Roof:** R1.5 blanket insulation

These layers work in concert to create a highly efficient thermal envelope, minimising heat transfer and reducing the need for artificial climate control.

## Glazing Strategy

The fenestration design is equally thoughtful. Large PVC window frames housing double glazed, Low E glass allow for abundant natural light while maintaining thermal integrity. The designers have strategically minimised west-facing windows to control heat gain, demonstrating a nuanced understanding of solar orientation.





## Off-Grid Capabilities

Powering this high-performance home is a 15KW solar system complete with battery storage, enabling off-grid living without compromising on modern comforts. This integration of renewable energy systems showcases the potential for self-sufficiency in residential design.

## Collaborative Excellence

The success of the Eden 20 project hinged on close collaboration between Swanbuild and James Hardie's technical team. This partnership ensured not only aesthetic cohesion but also rigorous compliance with building regulations, highlighting the importance of manufacturer support in pushing design boundaries.



○ The Eden 20's  
● design is a  
masterclass  
in form meeting  
function.

## Reflections for Practice

The Eden 20 project offers several key takeaways for architects and building designers:

- 1. Holistic Approach:** Energy efficiency is achieved through a combination of orientation, material selection, and systems integration.
- 2. Material Innovation:** The use of advanced cladding systems can significantly contribute to both aesthetic goals and performance metrics.
- 3. Modular Potential:** Prefabricated construction, when executed with precision, can achieve high-performance outcomes comparable to or exceeding traditional builds.
- 4. Collaboration:** Close work with material suppliers and technical experts is crucial for innovative design solutions.



## Future-Proofing Design

As the construction industry gears up for more stringent energy efficiency requirements—with the National Construction Code set to mandate a 7-star minimum—the Eden 20 stands as a blueprint for exceeding these standards. It demonstrates that with thoughtful design and material selection, modular construction can lead the way in sustainable residential design.

As we move towards a more sustainable future, projects like the Eden 20 serve as invaluable case studies. They challenge us to rethink our approach to residential design, proving that high-performance homes can be both beautiful and efficient. For architects and building designers, this modular marvel is not just inspiration—it's an invitation to push the boundaries of what's possible in sustainable design.

# Global Green Tag

THE GOLD STANDARD FOR  
SUSTAINABLE DESIGN

In a world where sustainability claims can often feel like marketing fluff, Global GreenTag stands as a beacon of credibility. As one of the world's most robust certification systems for green products, Global GreenTag offers more than a seal of approval—it provides transparency, trust, and tangible proof that a product is as eco-friendly as it claims to be.

With climate change and environmental degradation becoming increasingly urgent issues, the design and construction industries are under pressure to adopt sustainable practices. Global GreenTag is helping lead this charge, empowering designers, builders, and manufacturers to make informed, responsible choices.





## What Is Global GreenTag?

Global GreenTag is an internationally recognised ecolabel that certifies the sustainability credentials of products across a range of industries, from building materials to interior finishes. It goes beyond the surface to assess the lifecycle impacts of a product, considering factors like resource use, emissions, toxicity, and health impacts.

The certification process is rigorous, scientific, and transparent, ensuring that only products meeting the highest environmental and health standards earn the coveted GreenTag mark.

## Why It Matters

The growing awareness around greenwashing—where companies falsely claim to be environmentally friendly—has created a demand for independent, credible certification systems. Global GreenTag provides just that, offering designers and consumers a way to distinguish genuinely sustainable products from those that merely market themselves as such.

For industry professionals, this is a game-changer. Specifying GreenTag-certified products means not only meeting compliance standards but also delivering on promises of sustainability to clients, stakeholders, and communities.





## How Global GreenTag Benefits Designers and Builders

### 1. Credible Assurance

Global GreenTag provides designers and builders with scientifically verified data about a product's sustainability. This reduces the guesswork in selecting materials and ensures alignment with environmental standards and certifications, such as LEED and WELL.

### 2. Holistic Sustainability

Unlike certifications that focus solely on one aspect of a product, such as energy efficiency, Global GreenTag takes a holistic view. It evaluates everything from raw material sourcing to the end-of-life recyclability of a product.

### 3. Healthier Spaces

Many GreenTag-certified products are also recognised for their contribution to healthier indoor environments. This is crucial for projects aiming to improve occupant wellbeing through better air quality and reduced exposure to toxins.

### 4. Compliance and Competitive Edge

With sustainability regulations tightening worldwide, using certified products ensures compliance while enhancing a project's marketability. For developers, a GreenTag-certified building can be a powerful selling point.

## A Catalyst for Change in Australia

Global GreenTag has particular relevance in Australia, where the construction industry is striving to align with ambitious sustainability goals. As extreme weather events, water scarcity, and biodiversity loss become pressing issues, the push for greener buildings is intensifying.

Australian architects and builders have long been leaders in sustainable innovation, and certifications like Global GreenTag help reinforce that reputation. By providing a trusted framework for evaluating products, GreenTag enables the industry to confidently specify materials that meet rigorous environmental standards.

## The Global Influence of GreenTag

What sets Global GreenTag apart is its international reach. Recognised in over 70 countries, it bridges the gap between global and local markets. For Australian manufacturers, achieving GreenTag certification can open doors to export markets where sustainability is a non-negotiable.

Similarly, for multinational projects, GreenTag ensures consistency in sustainability standards, making it easier to align practices across borders.

## Looking Ahead

As the green building movement gains momentum, certifications like Global GreenTag will play an increasingly vital role. They not only ensure that products meet current sustainability benchmarks but also push industries to innovate and aim higher.

Global GreenTag is more than a certification; it's a movement toward accountability, transparency, and a shared commitment to building a better future. For the design and construction industries, it's a powerful tool in the quest for truly sustainable spaces.

So, the next time you're evaluating materials for your project, look for the GreenTag certification. It's not just a label—it's a promise that your work contributes to a healthier planet.

# Adaptive Reuse of Heritage Buildings

## BALANCING SUSTAINABILITY WITH HISTORICAL INTEGRITY

Adaptive reuse of heritage buildings presents an opportunity to promote sustainability by conserving resources, reducing waste, and preserving cultural identity. This article explores the challenges and strategies involved in balancing environmental sustainability with the preservation of historical integrity. Through case studies and best practices, we examine how architects and building designers can successfully integrate modern sustainability requirements without compromising the heritage value of existing structures.

The construction industry is a significant contributor to global carbon emissions and resource consumption. Adaptive reuse—the process of repurposing old buildings for new functions—offers a sustainable alternative to demolition and new construction. Heritage buildings, in particular, hold cultural, historical, and architectural significance that merits preservation.

However, integrating modern sustainability standards into these structures poses unique challenges. This article delves into the complexities of adaptive reuse for heritage buildings and provides insights into achieving a harmonious balance between sustainability and historical integrity.

### The Importance of Adaptive Reuse

Adaptive reuse contributes to sustainability in several ways:

- **Resource Conservation:** Reusing existing structures reduces the need for new materials, thereby conserving natural resources and reducing embodied energy.
- **Waste Reduction:** It minimises demolition waste that would otherwise end up in landfills.
- **Cultural Preservation:** Maintains the historical and cultural narratives embedded within heritage buildings.

According to the Australian Government's Department of Agriculture, Water and the Environment, heritage conservation is crucial for maintaining the nation's identity and supporting sustainable development practices.



## Balancing Sustainability with Historical Integrity

### CHALLENGES

- **Regulatory Constraints:** Heritage buildings are often subject to strict conservation regulations that limit modifications.
- **Structural Limitations:** Older buildings may not meet current structural codes or energy efficiency standards.
- **Material Compatibility:** Introducing new materials can cause deterioration of original materials due to incompatibility.

### STRATEGIES

#### 1. Sensitive Design Approach

Employing a design approach that respects the building's original architecture. This includes minimal intervention and reversible changes where possible.

#### 2. Energy Efficiency Upgrades

- **Insulation:** Adding insulation in non-invasive ways, such as using breathable materials that do not trap moisture.
- **Windows:** Installing secondary glazing to improve thermal performance without replacing original windows.

#### 3. Renewable Energy Integration

- **Solar Panels:** Utilising building-integrated photovoltaics (BIPV) designed to blend with the existing roofscape.
- **Geothermal Systems:** Installing geothermal heating and cooling systems that do not alter the building's appearance.

#### 4. Material Reuse

Salvaging and reusing materials from the building itself or other heritage structures to maintain historical authenticity.



### Case Study - Art House

Originally an Art Deco heritage-listed home, Art House seamlessly integrates historical elegance with contemporary design. The challenge was to respect the curved forms of the existing dwelling while introducing innovative new spaces.

#### Key Design Features:

- **Sensitive Heritage Adaptation:** Two curved pavilions complement the original architecture, using custom orb cladding to contrast the smooth stucco facade.
- **Modern Enhancements:** High ceilings and strategically placed windows maximise views of Mount Keira while ensuring privacy.



Joel Etherington - Art House

- **Sustainability Focus:** Passive solar design, low-e glazing, and thermal mass help optimise energy efficiency.
- **Unique Details:** Features like an inverted window hood for shading provide a modern twist on Art Deco elements.

This project reimagines heritage preservation, proving that thoughtful design can harmonise history with innovation, creating a timeless, functional space.

## Best Practices

### Collaborative Planning

Involving conservationists, architects, engineers, and sustainability consultants early in the project to address potential conflicts.

### Regulatory Navigation

Working closely with heritage authorities to obtain necessary approvals while advocating for sustainable interventions.

### Community Engagement

Engaging local communities to garner support and ensure that the adaptive reuse meets social as well as environmental objectives.

---

Adaptive reuse of heritage buildings is a complex but rewarding endeavour that contributes significantly to sustainability goals while preserving cultural heritage. By employing sensitive design strategies, leveraging modern technology, and fostering collaborative efforts, it is possible to enhance the environmental performance of heritage buildings without compromising their historical integrity.

# Circular Design in Architecture

## REDUCING WASTE THROUGH LIFE-CYCLE PLANNING

Circular design in architecture focuses on creating buildings that minimise waste and maximise resource efficiency throughout their life cycle. This approach challenges the traditional linear model of 'take, make, dispose' by promoting a regenerative system where materials and components are reused, recycled, or repurposed. This article explores the principles of circular design, its benefits, and practical strategies for architects and building designers to implement life-cycle planning in their projects.

### Introduction

The construction industry is a major consumer of natural resources and a significant contributor to waste and carbon emissions. Traditional linear models of production and consumption are unsustainable in the face of finite resources and environmental degradation. Circular design offers an alternative by reimagining the life cycle of buildings and materials to create a closed-loop system that reduces environmental impact.

### Principles of Circular Design

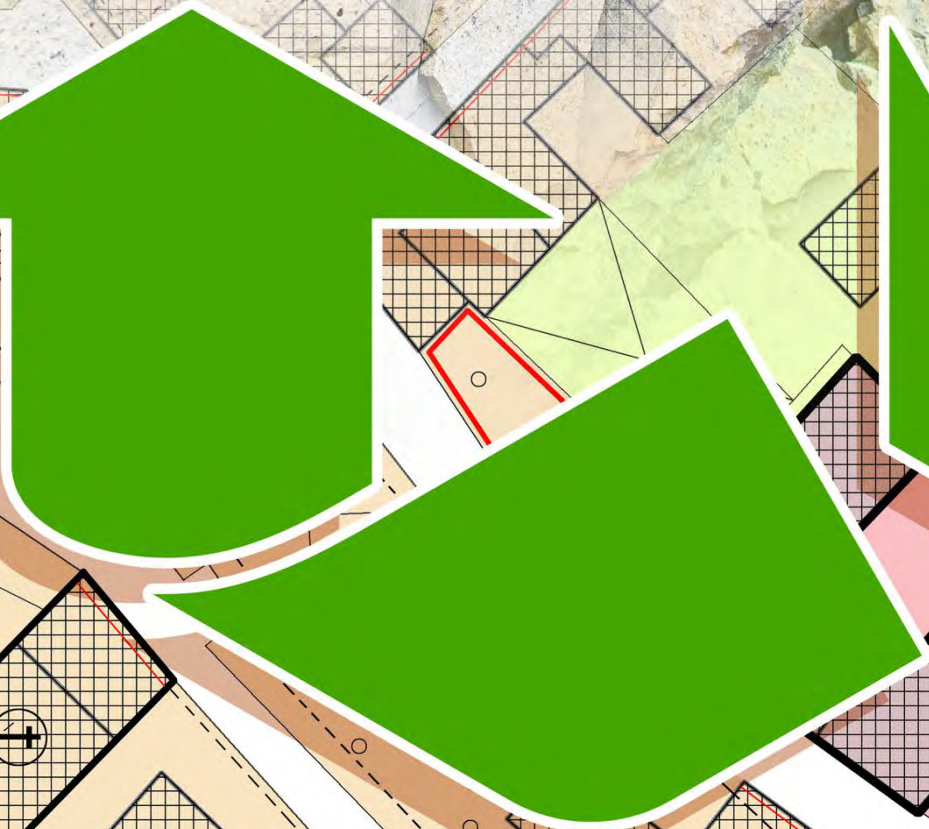
Circular design is based on several key principles:

- **Design Out Waste:** Eliminating waste through thoughtful design choices that consider the end-of-life of materials and components.
- **Keep Products and Materials in Use:** Extending the lifespan of buildings and their components through maintenance, reuse, refurbishment, and adaptive reuse.
- **Regenerate Natural Systems:** Enhancing ecosystems by returning valuable nutrients to the environment and using renewable resources.

According to the Ellen MacArthur Foundation, applying circular economy principles could significantly reduce global greenhouse gas emissions and resource use.

### Benefits of Circular Design in Architecture

- **Resource Efficiency:** Reduces the consumption of raw materials by reusing existing resources.
- **Waste Reduction:** Minimises construction and demolition waste through material recovery and recycling.
- **Economic Advantages:** Lowers costs over the building's life cycle due to reduced material needs and potential for material recovery.
- **Environmental Impact:** Decreases carbon footprint and promotes sustainable resource management.



24.1

16

25

25.1

24.8

P

## Strategies for Implementing Circular Design

### 1. Life-Cycle Assessment (LCA)

Conduct life-cycle assessments to evaluate the environmental impacts associated with all stages of a building's life, from material extraction to end-of-life disposal. This helps in making informed decisions to reduce overall impact.

### 2. Modular Design

Design buildings with modular components that can be easily assembled, disassembled, and reconfigured. This facilitates maintenance, upgrades, and eventual reuse or recycling of components.

### 3. Material Selection

- **Use of Recycled Materials:** Incorporate materials with recycled content to reduce the demand for virgin resources.
- **Biodegradable Materials:** Choose materials that can safely return to the environment at the end of their life.
- **Material Passports:** Document the materials used in a building to facilitate future recycling and reuse.

### 4. Design for Disassembly

Plan buildings so that components can be easily separated and recovered at the end of their useful life. This involves selecting appropriate connections and materials that do not degrade over time.

### 5. Adaptive Reuse Potential

Design new buildings with future adaptability in mind, allowing for changes in use without significant structural modifications.





## Case Studies

### Edge Environment Office, Sydney

The fit-out of Edge Environment's Sydney office exemplifies circular design principles. The project utilised reclaimed materials, including timber and furniture, and was designed for future disassembly and reuse. This approach reduced waste and embodied energy significantly.

### The Bank of New Zealand Headquarters, Wellington

This building was designed with a focus on flexibility and adaptability. Modular floor plates and services allow for easy reconfiguration, extending the building's functional life and reducing the need for future renovations.

## Challenges and Considerations

- **Economic Viability:** Initial costs can be higher due to the need for specialised materials or design processes.
- **Regulatory Barriers:** Building codes and standards may not always accommodate innovative circular design solutions.
- **Supply Chain Limitations:** Availability of suitable recycled or sustainable materials can be a constraint.

## Best Practices

### Early Integration

Incorporate circular design principles from the project's inception to maximise benefits.

### Stakeholder Engagement

Collaborate with clients, contractors, and suppliers to align goals and facilitate the implementation of circular strategies.

### Education and Training

Equip design teams with knowledge and skills in circular design methodologies.

---

Circular design in architecture offers a transformative approach to building that addresses environmental challenges by reducing waste and promoting resource efficiency. By embracing life-cycle planning and implementing practical strategies, architects and building designers can contribute to a more sustainable and regenerative built environment.

# Building for a Hotter Future

## JAMES HARDIE'S BUSHFIRE-RESISTANT CLADDING LEADS THE WAY

In the sun-scorched landscape of Australia, where the threat of bushfires looms larger each year, reliable home-building solutions are critical. James Hardie's innovative cladding systems offer dependable protection, particularly in bushfire-prone areas, while addressing the demands of an evolving Australian climate.

### When the Heat is On

Picture this: A wall of flame approaches a suburban home. The air crackles with intensity, temperatures soar, and in mere moments, the fate of the structure will be decided. It's in these critical instances that James Hardie's fibre cement cladding proves its mettle.

"Our Hardie™ Architectural Collection isn't just about aesthetics—it's a shield," says Luke Cheng, Trade Marketing Manager. "In bushfire zones up to BAL40, it's a reliable solution for ensuring homes stand strong."

For zones with varying levels of risk, James Hardie offers a range of cladding options, including the Matrix™ Cladding for BAL29 zones and the Hardie™ Smart Fire & Acoustic Boundary Wall System, which delivers a fire resistance level (FRL) of 60 minutes in BAL FZ zones.



Matrix™ Cladding

### Beyond the Flames

Beyond bushfire resistance, James Hardie's cladding systems are celebrated for their durability, including features like;

- **Termite-proof:** No more sleepless nights worrying about silent invaders.
- **Moisture-resistant:** Say goodbye to warping and rot.
- **Energy-efficient:** When paired with Hardie™ Wrap Weather Barrier, these systems can help achieve up to 7-star energy ratings.

"It's not just about surviving a bushfire," explains Luke Cheng. "It's about creating homes that stand the test of time, adapt to Australia's evolving climate conditions, and reduce our environmental footprint."



Linea™ Weatherboard



## The Competition Heats Up

In the world of bushfire-resistant cladding, James Hardie isn't alone. FireCrunch offers BAL FZ cladding with an impressive 90/90/90 Fire Resistance Level, while Fire Safe Cladding brings aluminium solutions to the table.

But here's where James Hardie pulls ahead:

- 1. Variety is the Spice of Life:** From Hardie™ Fine Texture Cladding to Linea™ Weatherboard, the options are as diverse as the Australian landscape itself.
- 2. Australian-Made Excellence:** Proudly Australian-made, James Hardie products are designed and manufactured to withstand the unique and often harsh

conditions of the Australian landscape, ensuring durability and reliability that local builders and homeowners can trust.

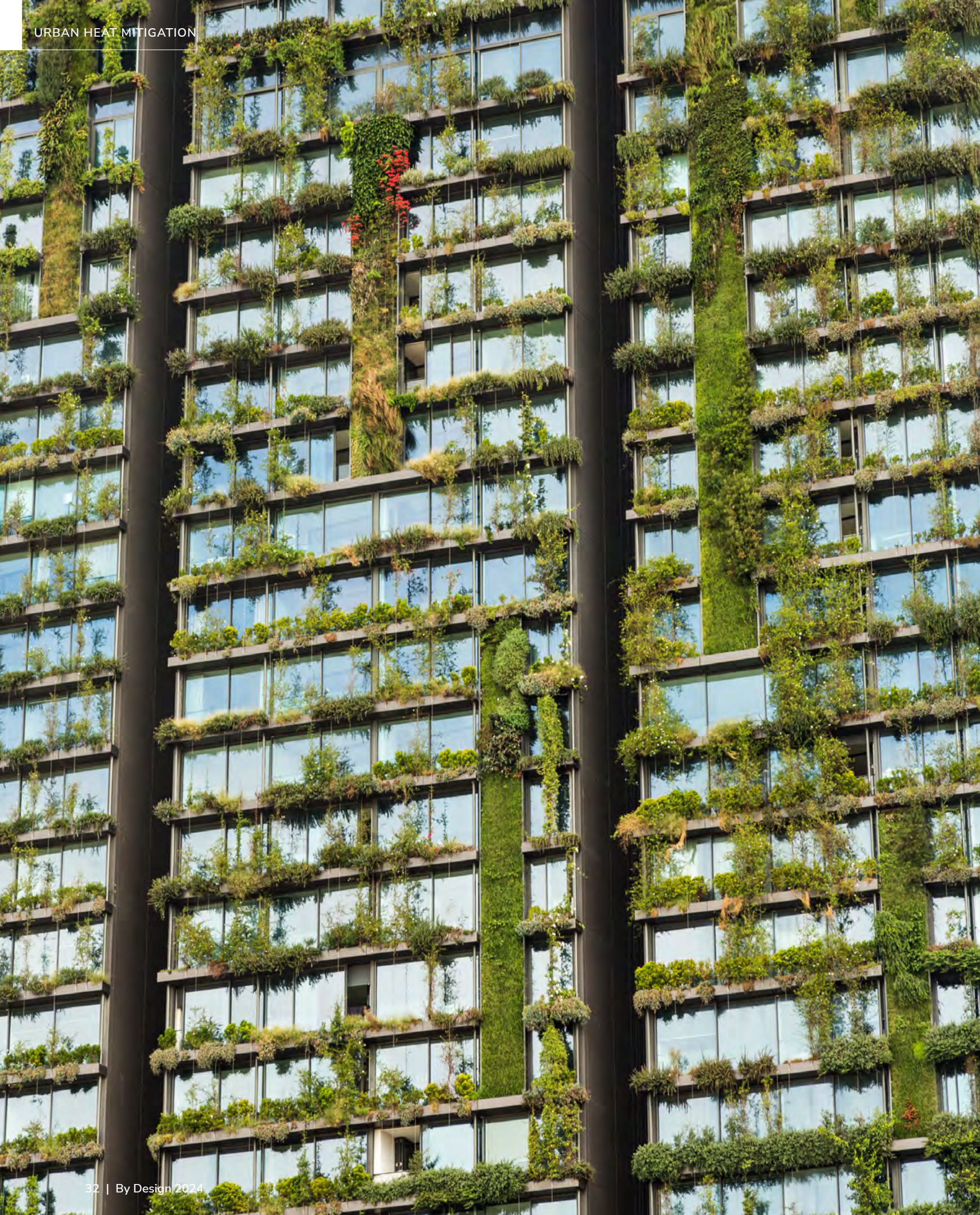
- 3. The Whole Package:** The Hardie™ Smart Fire & Acoustic Boundary Wall System offers a comprehensive solution that many competitors simply can't match.

## Looking to the Future

As climate change turns up the heat on Australian homes, the importance of bushfire-resistant, sustainable building materials cannot be overstated. James Hardie's commitment to innovation in this space isn't just about protecting homes—it's about preserving a way of life.

"We're not just building houses," says Paul David, Head of Product APAC, at James Hardie. "We're creating sanctuaries that can withstand whatever nature throws at them, while still being beautiful, energy-efficient spaces to live in."

In a country where the landscape is as breathtaking as it is unforgiving, James Hardie is proving that with the right materials and systems, we can build homes that are not just surviving, but thriving in the face of adversity. As bushfires become an increasingly common threat, these innovative cladding solutions offer more than just protection—they offer peace of mind.



# Urban Heat Mitigation

## THROUGH GREEN ROOFS AND VERTICAL GARDENS

As urban areas expand, the concentration of buildings and impervious surfaces leads to the Urban Heat Island (UHI) effect, where cities experience higher temperatures than surrounding rural areas. This phenomenon contributes to increased energy consumption, health risks, and environmental stress. Green roofs and vertical gardens have emerged as effective strategies to mitigate urban heat by introducing vegetation into built environments. This case study examines successful implementations of these green technologies in Australia, highlighting their impact on urban heat reduction and the benefits for architects, building designers, and energy assessors.

### The Urban Heat Island Effect

Urban Heat Islands result from the replacement of natural land with dense concentrations of pavement, buildings, and other surfaces that absorb and retain heat. Key factors contributing to UHI include:

- **Reduced Vegetation:** Loss of trees and plants that provide shade and evaporative cooling.
- **Heat-Absorbing Materials:** Use of dark, non-reflective materials that store heat.
- **Waste Heat:** Emissions from vehicles, industrial facilities, and air conditioning units.

○ Mitigating UHI is crucial for improving urban sustainability, reducing energy costs, and enhancing the quality of life for city dwellers.

### Green Roofs and Vertical Gardens as Solutions

#### Green Roofs

Green roofs involve the installation of vegetation layers on rooftops, providing numerous benefits:

- **Thermal Regulation:** Vegetation absorbs less heat than conventional roofing materials, reducing indoor temperatures.
- **Stormwater Management:** Plants and soil absorb rainwater, decreasing runoff and relieving urban drainage systems.
- **Biodiversity Enhancement:** Creates habitats for birds and insects in urban settings.

#### Vertical Gardens

Vertical gardens, or green walls, incorporate plants along vertical building surfaces:

- **Space Efficiency:** Ideal for urban areas with limited horizontal space.
- **Air Quality Improvement:** Plants filter pollutants and improve air quality.
- **Aesthetic Appeal:** Enhances building facades with natural beauty.

## Case Study 1: One Central Park, Sydney

### Overview

One Central Park is a mixed-use residential and retail development renowned for its extensive vertical gardens designed by French botanist Patrick Blanc in collaboration with architects Ateliers Jean Nouvel and PTW Architects.

### Implementation

- **Vertical Gardens:** The building features over 1,000 square metres of vertical gardens with around 35,000 plants.
- **Heliostat System:** Mirrors redirect sunlight to shaded areas, promoting plant growth and providing natural light to lower levels.
- **Energy Efficiency:** Incorporates tri-generation power plant and water recycling systems.

### Impact

- **Urban Heat Reduction:** The extensive greenery reduces surface temperatures, mitigating the UHI effect.
- **Energy Savings:** Residents benefit from lower energy costs due to improved insulation and reduced need for air conditioning.
- **Awards:** The project has received multiple accolades, including the Best Tall Building Worldwide in 2014.

## Case Study 2: The Venny, Melbourne

### Overview

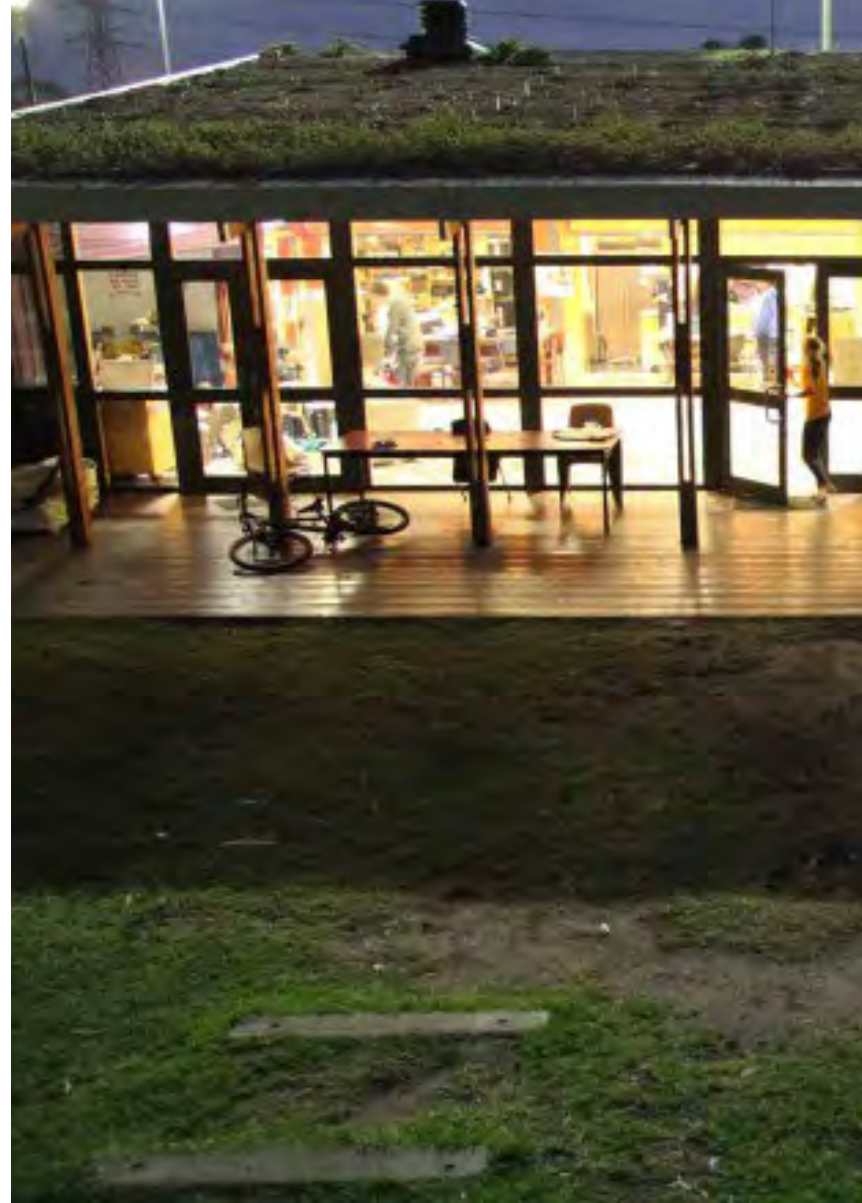
The Venny is a communal backyard and play space for children in Kensington, featuring a green roof designed to blend with the surrounding parkland.

### Implementation

- **Intensive Green Roof:** Supports larger plants, including shrubs and small trees.
- **Educational Space:** Serves as a learning tool for children about sustainability and ecology.
- **Sustainable Materials:** Utilised recycled and locally sourced materials in construction.

### Impact

- **Thermal Comfort:** The green roof provides insulation, maintaining comfortable indoor temperatures.
- **Community Engagement:** Enhances community space and promotes environmental awareness among youth.
- **Environmental Benefits:** Increases local biodiversity and contributes to stormwater management.



## Benefits for Building Professionals

- **Architects and Designers:** Opportunity to incorporate innovative green solutions that enhance building performance and aesthetics.
- **Energy Assessors:** Green roofs and walls contribute to higher energy ratings by improving thermal performance.
- **Compliance and Ratings:** Projects may achieve higher Green Star ratings and meet sustainability criteria set by councils and regulatory bodies.

## Challenges and Considerations

- **Structural Support:** Additional weight of soil and vegetation requires assessment of building structure.
- **Maintenance:** Ongoing care is necessary to ensure plant health and system functionality.
- **Waterproofing and Drainage:** Proper installation is essential to prevent water leakage and damage.



Green roofs and vertical gardens offer practical and impactful solutions for mitigating urban heat in Australian cities. Through the successful examples of One Central Park and The Venny, it's evident that integrating vegetation into urban structures can significantly reduce temperatures, enhance energy efficiency, and provide social and environmental benefits. Architects, building designers, and energy assessors play a pivotal role in adopting these green technologies, contributing to more sustainable and liveable urban environments.

○ Incorporating greenery into buildings reduces heat absorption and lowers city temperatures.

## Best Practices

### 1. Early Integration

Incorporate green roof and wall designs at the initial planning stages to address structural and engineering requirements.

### 2. Plant Selection

Choose native and drought-tolerant species suited to local climate conditions to reduce maintenance and water usage.

### 3. Collaboration

Work with landscape architects, horticulturalists, and structural engineers to ensure successful implementation.

### 4. Irrigation Systems

Install efficient irrigation, such as drip systems, possibly integrated with rainwater harvesting.

### 5. Monitoring and Maintenance Plans

Develop a long-term maintenance strategy to preserve the health of the vegetation and integrity of the building.

## Key Takeaways

- **Mitigation of UHI Effect:** Incorporating greenery into buildings reduces heat absorption and lowers city temperatures.
- **Enhanced Building Performance:** Green roofs and walls improve insulation, leading to energy savings.
- **Environmental and Social Benefits:** These solutions support biodiversity, improve air quality, and create pleasant spaces for communities.
- **Professional Opportunities:** Building professionals can leverage green technologies to meet sustainability goals and regulatory requirements.

By embracing green roofs and vertical gardens, the building industry can make significant strides in addressing urban heat challenges, fostering a harmonious relationship between built environments and nature.

# Redefining Timber

FOR A SUSTAINABLE, RESILIENT FUTURE



Australia's love for timber in construction is deeply rooted in its natural beauty and environmental benefits. Yet, for decades, the challenge of using timber in bushfire-prone areas has limited its potential. Enter FLAMEfixx dFx® by ITI Australia—a game-changing innovation that blends sustainability with safety, offering a revolutionary approach to timber construction.

## Sustainability Without Compromise

Timber is one of the most sustainable building materials available, but its susceptibility to fire has often pushed designers and builders to opt for less sustainable alternatives in high-risk zones. FLAMEfixx dFx® changes the game. This fire-resistant timber product is made from plantation-grown Radiata pine, a renewable resource, and has been treated to meet Bushfire Attack Level (BAL) 29 standards.

What makes this innovation remarkable is its dual focus: environmental responsibility and fire resilience. By utilising timber from sustainably managed plantations, FLAMEfixx dFx® allows projects to maintain a low carbon footprint while ensuring compliance with Australia's stringent bushfire regulations.

## Advanced Technology, Endless Potential

The secret to FLAMEfixx dFx® lies in its advanced treatment process. ITI Australia employs a vacuum/pressure impregnation technique that infuses the timber with fire-

retardant compounds. This not only enhances fire resistance but also protects the wood from fungal decay and termites, significantly extending its lifespan.

The result? A material that's as durable as it is beautiful. Builders and designers can confidently use FLAMEfixx dFx® in applications where safety and sustainability are equally critical—without sacrificing aesthetic appeal.

## Built for Australia's Unique Challenges

FLAMEfixx dFx® is more than a product; it's a solution designed for Australia's diverse and demanding environments. From residential developments in bushfire-prone regions to commercial projects prioritising eco-conscious materials, this timber innovation meets the need for performance and sustainability.

Its ability to combine natural carbon storage with resilience against extreme conditions positions FLAMEfixx dFx® as a cornerstone of sustainable construction in Australia. It's an answer to the growing demand for materials that support climate-adaptive, eco-friendly building practices.

## The Future of Timber Construction

As the construction industry continues to evolve, products like FLAMEfixx dFx® are paving the way for a new era in timber design. By addressing fire safety without compromising sustainability, ITI Australia is proving that timber can be both practical and environmentally responsible in even the most challenging applications.

For building designers, builders, and architects, the implications are clear: FLAMEfixx dFx® represents a shift toward smarter, greener building practices. It enables the use of renewable materials in ways that were previously out of reach, opening the door to more resilient and sustainable structures.

# ITI Australia

Innovative Timber Ideas

Brands to build with<sup>®</sup>



Like us on social media    @iti\_au

[itiaustralia.com.au](http://itiaustralia.com.au)

# Deconstruction vs. Demolition

## A DESIGNER'S GUIDE TO MATERIAL SALVAGE

### Turning Waste into Opportunity

In a world grappling with the urgent need for sustainability, the building industry faces a critical challenge: reducing waste and minimising its environmental impact. As building designers and energy assessors, we play a crucial role in shaping a more sustainable future. One powerful strategy gaining momentum is deconstruction, a thoughtful alternative to traditional demolition that prioritises material salvage and reuse.

Imagine carefully dismantling a building, piece by piece, like an intricate puzzle. Instead of ending up in landfill, valuable materials like timber, bricks, and steel find new life in other projects. This is the essence of deconstruction, a process that not only minimises waste but also unlocks economic and social benefits.

### The Deconstruction Process: A Careful Dismantling

Deconstruction involves a systematic approach to taking apart a building, with a focus on recovering materials in good condition. Skilled deconstruction contractors employ specialised tools and techniques to carefully remove components, such as:

- **Manual Labour:** Much of the work is done by hand, using tools like crowbars, saws, and hammers to carefully extract materials.
- **Selective Mechanical Equipment:** Small machinery like mini-excavators and skid steers may be used for tasks like removing larger structural elements, but the emphasis remains on minimising damage to salvageable materials.
- **Strategic Planning:** Deconstruction requires meticulous planning and coordination. Contractors assess the building, identify valuable materials, and develop a detailed dismantling plan.

### Salvaging Valuable Materials: Unearthing Hidden Treasures

A wealth of materials can be salvaged during deconstruction, including:

- **Timber:** Reclaimed timber, especially old-growth lumber, is highly sought after for its character and durability. It can be reused for flooring, beams, furniture, and more.
- **Bricks:** Bricks can be cleaned and reused in new construction or landscaping projects.
- **Steel:** Structural steel can be repurposed for new buildings or other applications.
- **Fixtures and Fittings:** Doors, windows, light fixtures, and plumbing fixtures can often be reused or refurbished.
- **Benefits Beyond the Environment:** A Win-Win Solution





**Deconstruction offers a compelling array of benefits:**

**Environmental:** Reduces landfill waste, conserves natural resources, and lowers embodied carbon emissions.

**Economic:** Generates revenue from salvaged materials, creates jobs in the deconstruction and reuse sectors, and lowers disposal costs.

**Social:** Supports community development, preserves architectural heritage, and promotes a culture of reuse.



## Case Studies: Deconstruction in Action

- **The Reclaimed Timber Company (Melbourne):** This company specialises in salvaging timber from demolished buildings and transforming it into beautiful flooring, furniture, and architectural features.
- **The Green Demolition (Sydney):** This company pioneers deconstruction practices in Australia, offering a range of services from material salvage to building reuse.
- **Second Chance, Inc. (Baltimore, USA):** This non-profit organisation has deconstructed over 1,000 buildings, providing job training and creating affordable housing with salvaged materials.

## Overcoming Challenges: Addressing Concerns

While deconstruction offers significant advantages, it's important to acknowledge the challenges:

- **Cost:** Deconstruction can be more expensive than demolition upfront, but the long-term economic and environmental benefits often outweigh the initial costs.
- **Time:** Deconstruction takes more time than demolition, requiring careful planning and execution.
- **Logistics:** Handling and storing salvaged materials requires space and careful management.
- **The Designer's Role:** Designing for Disassembly

Building designers have a crucial role to play in facilitating deconstruction:

- **Design for Disassembly:** Use modular components, standardised connections, and easily removable fasteners to make future deconstruction easier.
- **Material Selection:** Choose durable and reusable materials.
- **Collaboration:** Consult with deconstruction experts early in the design process.

---

## Embracing a Circular Future

Deconstruction represents a powerful shift towards a circular economy in the building industry. By embracing deconstruction, we can turn waste into opportunity, minimise our environmental impact, and create a more sustainable future for generations to come. As building designers and energy assessors, we have the knowledge and the responsibility to lead the way.

JAMES HARDIE'S

# Commitment to Sustainability

**GOALS AND PROGRESS**

James Hardie, a global leader in building materials, has set ambitious sustainability goals that address environmental impact, resource efficiency, diversity, and workplace safety. By aligning their objectives with global priorities and stakeholder expectations, James Hardie demonstrates a proactive approach to fostering a sustainable future.

## Reducing Emissions

A key focus for James Hardie is achieving a 42% reduction in Scope 1 and 2 greenhouse gas emissions by 2030 (from a 2021 baseline), with long-term ambitions to reach net-zero emissions by 2050. This commitment highlights the company's role in combating climate change through improved energy efficiency and innovative manufacturing processes.

## Water Recycling

Water efficiency remains a priority, with a target to recycle an additional 20 million cubic feet of water annually by 2030 compared to 2019 levels. Progress is already evident, with significant increases in water recycling capacity year-over-year, underscoring James Hardie's efforts to conserve this critical resource.

## Minimising Waste

James Hardie is committed to achieving zero manufacturing waste to landfill by 2035, reducing the environmental impact of its operations. Steady progress in lowering waste volumes reflects the company's focus on circular practices and responsible resource management.

## Increasing Diversity

Recognising the importance of diversity and inclusion, James Hardie aims to increase representation across senior leadership and management roles. Goals include reaching 30% women in leadership and enhancing opportunities for underrepresented minorities in management positions by FY26, reflecting their broader commitment to equity and workplace empowerment.

## Prioritising Safety

Safety remains at the heart of James Hardie's operations. By fostering a Zero Harm culture, the company consistently outperforms industry safety benchmarks, reducing the rate of days lost due to injury and restricted activity. This commitment ensures the wellbeing of its workforce while maintaining operational excellence.

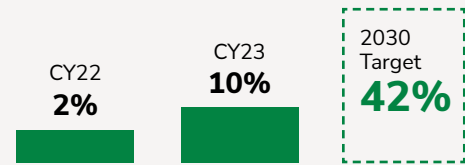
Through these goals, James Hardie is not only advancing its sustainability journey but also setting a standard for the building industry. By combining innovation, accountability, and measurable progress, James Hardie continues to pave the way for a more sustainable and resilient built environment.

**SUSTAINABILITY GOAL** **PROGRESS**

**Reducing Scope 1+2 emissions**

42% absolute reduction in Scope 1+2 GHG emissions by 2030, compared to CY21 baseline, and work towards net zero by 2050

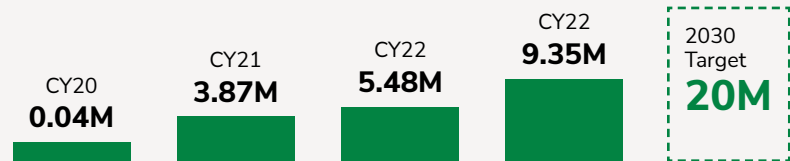
Scope 1+2 emissions reduction from CY21 baseline



**Recycling water**

Recycle an additional 20M cubic feet of water per year by 2030, compared to CY19 baseline

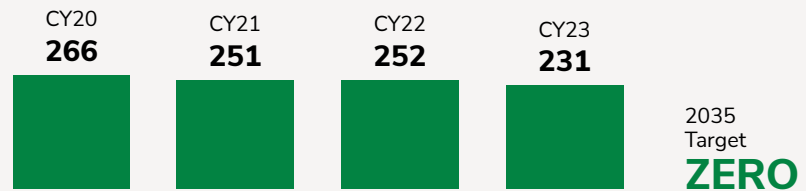
Additional water recycled per year vs CY19 (cubic feet)



**Minimizing waste**

Zero manufacturing waste to landfill by 2035

Manufacturing waste disposed to landfill (thousand MT)



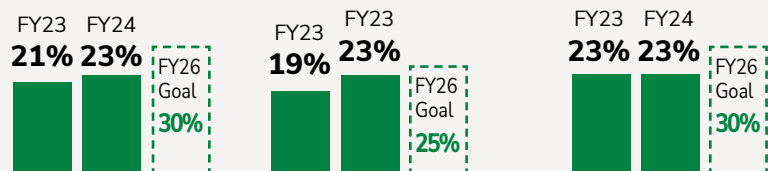
**Increasing diversity**

Increase diversity in management and senior leadership

Women in senior leadership

Women in management

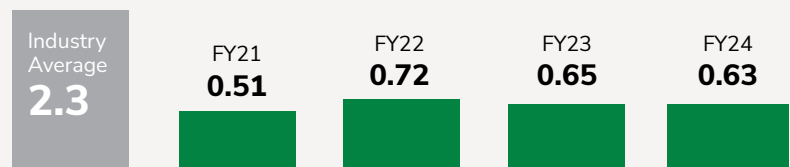
Underrepresented minorities in management (U.S. only)



**Prioritizing safety**

Continuously improve our Zero Harm culture, processes and systems

Days away from work, restricted work activity or job transfer rate (DART)



**42%**

Absolute scope 1+2 emissions reduction by 2030

**ZERO**

Manufacturing waste to landfill by 2035

**25%**

Women in management by FY26

# Beyond Solar Panels

## INTEGRATING RENEWABLE ENERGY INTO BUILDING DESIGN

Australia is a land of abundant sunshine, and it's no surprise that solar panels have become a ubiquitous sight on rooftops across the country. But as we strive for ever-greater sustainability in the built environment, it's time to look beyond the familiar and explore the full spectrum of renewable energy possibilities.



Dylan Barber - Park Residence

Imagine a building that not only generates its own clean energy but does so with elegance and innovation. Picture sleek solar skins integrated seamlessly into facades, vertical axis wind turbines turning quietly on rooftops, and micro-hydro systems harnessing the power of flowing water. This is the future of sustainable building design, where renewable energy technologies become an integral part of the architectural vision, enhancing both aesthetics and functionality.

In this article, we'll delve into the exciting world of integrated renewable energy systems, showcasing cutting-edge technologies and inspiring Australian examples. We'll explore how building designers are pushing the boundaries of solar, wind, and hydro power, creating buildings that are not only environmentally responsible but also beautiful and inspiring.

### Solar Power: Pushing the Boundaries

While rooftop solar panels have become commonplace, architects and designers are pushing the boundaries of solar technology, seamlessly integrating it into the very fabric of buildings.

- **Building-Integrated Photovoltaics (BIPV):** BIPV takes solar energy to the next level by incorporating photovoltaic materials into building components such as facades, roofs, and even windows. Imagine a sleek, modern home with solar cells embedded in its roof tiles, generating clean energy while maintaining a stylish aesthetic. Or picture a commercial building

with a shimmering glass facade that doubles as a solar power generator. BIPV not only reduces energy costs but also enhances the visual appeal of buildings. The award-winning Pixel Building in Melbourne exemplifies this approach, with its colourful facade composed of solar panels that generate a significant portion of the building's energy needs.

- **Solar Skins:** For those seeking a more subtle integration of solar technology, solar skins offer an exciting solution. These thin-film solar panels can be applied to various building surfaces, including curved or irregular shapes, providing a flexible and aesthetically pleasing way to generate clean energy. They can even be customised to match the colour and texture of the building, blending seamlessly into the design. Imagine a heritage building in Sydney with its historic facade preserved, while discreetly generating solar power through an invisible solar skin.
- **Solar Thermal:** Beyond electricity generation, solar energy can also be harnessed for heating applications. Solar thermal systems use sunlight to heat water, which can be used for domestic hot water or space heating. This reduces reliance on gas or electric heating, further minimising a building's environmental footprint. In Australia's sunny climate, solar thermal systems are a highly effective way to provide renewable hot water, particularly in residential buildings.

## Wind Power: Harnessing the Breeze

While large-scale wind farms are a familiar sight in many parts of Australia, wind power can also be integrated into individual buildings, particularly in urban environments.

- **Vertical Axis Wind Turbines (VAWTs):** Unlike traditional wind turbines with horizontal blades, VAWTs have a vertical axis of rotation, making them ideal for urban settings with turbulent wind patterns. They are also quieter and less visually intrusive, making them suitable for rooftops and building facades. The Council House 2 (CH2) building in Melbourne features a striking array of VAWTs on its rooftop, contributing to the building's impressive sustainability credentials.
- **Building-Integrated Wind Turbines:** Architects are increasingly incorporating wind turbines into the design of buildings, creating a striking visual statement while generating clean energy. Imagine a high-rise building with wind turbines seamlessly integrated into its facade, harnessing the power of the wind to reduce its reliance on the grid. One example is the Bahá'í House of Worship in Sydney, which incorporates wind turbines into its unique architectural design.



## Hydro Power: Tapping into Water

While large-scale hydropower projects are limited in Australia, micro-hydropower systems offer a promising solution for individual buildings or small communities, particularly in rural and regional areas.

- **Micro-Hydropower Systems:** These small-scale systems can generate electricity from flowing water sources such as streams, rivers, or even irrigation channels. They are particularly well-suited to properties with existing water features or those located near natural watercourses. Imagine a sustainable farm in rural Victoria generating its own clean energy from a nearby stream, reducing its reliance on fossil fuels and contributing to a more resilient energy system.
- **Rainwater Harvesting and Greywater Reuse:** By integrating rainwater harvesting and greywater reuse systems with micro-hydropower, buildings can create a closed-loop water and energy cycle. Rainwater collected from rooftops can be used to generate electricity, while greywater can be recycled for irrigation or other non-potable uses.

## Aesthetic and Functional Considerations

Integrating renewable energy systems successfully requires careful consideration of both aesthetics and functionality.

- **Visual Integration:** Renewable energy systems should be seamlessly incorporated into the building's design, complementing its architectural style rather than appearing as an afterthought. This can be achieved through careful selection of materials, colours, and placement of the systems.
- **Multi-Functionality:** Renewable energy systems can serve multiple purposes, enhancing their value and appeal. For example, solar panels can provide shade, wind turbines can act as sound barriers, and green roofs can contribute to rainwater harvesting and insulation.
- **Smart Technology:** Integrating renewable energy systems with smart building technologies can optimise their performance and maximise energy efficiency. Smart sensors and controls can monitor energy production and consumption, adjusting systems in real-time to ensure optimal use of renewable resources.

## Case Studies: Inspiring Australian Examples

Australia boasts a growing number of buildings that showcase innovative integration of renewable energy systems.

- **The Pixel Building (Melbourne):** This mixed-use development features a colourful facade composed of BIPV panels, generating a significant portion of the building's energy needs.
- **Council House 2 (CH2) (Melbourne):** This iconic building incorporates a range of sustainable features, including VAWTs on its rooftop and a geothermal heating and cooling system.
- **Bahá'í House of Worship (Sydney):** This unique building features wind turbines integrated into its architectural design, demonstrating the potential for combining aesthetics and functionality





As Australia continues its transition towards a more sustainable future, integrating renewable energy systems into building design is becoming increasingly important. By going beyond solar panels and exploring the full spectrum of renewable energy options, building designers can create buildings that are not only environmentally responsible but also beautiful and inspiring. Through innovative technologies and design strategies, we can harness the power of nature to create a built environment that is truly sustainable and resilient.



Congratulations to Our

# Green Facelift

Challenge Winners!



**Aaron Durston**

*First place winner*



**Belinda Welsh**

*Second place winner*



## Designing the Future: Celebrating Sustainability and Innovation

The Building Designers Association of Australia (BDAA) proudly announced the winner of the 2024 ITI Australia Green Face Lift Student Design Award Challenge, showcasing the remarkable talent of student designers shaping the future of sustainable architecture.

This year's accolade was awarded to **Aaron Durston**, a student member of BDAA Western District chapter. With an innovative design for ITI's St Mary's office façade, Aaron demonstrated an exceptional ability to blend sustainability with aesthetic brilliance.

### A Winning Vision

Aaron's design wasn't just a facelift—it was a statement of purpose. His work incorporated over 50% Weathertex products, emphasising sustainable materials while enhancing energy efficiency. The judges lauded Aaron's attention to street-facing design, which created a visually iconic and environmentally conscious transformation. His deep understanding of material application and sustainable principles set a new benchmark for design excellence.

### Inspiring a Generation of Sustainable Designers

The competition serves as more than just a contest—it's a powerful platform for bridging the gap between academic theory and real-world application.

**Chris Knierim**, BDAA CEO and industry advocate, highlighted its significance:

"Our objective at BDAA is to prepare our student members with the tools and knowledge to enter the workforce with the greatest learning opportunities. By participating in these detailed discussions and receiving feedback from industry experts, the students gained a deeper understanding of how to effectively utilise materials, overcome design challenges, and adhere to industry standards."

## The Role of Industry Partners

This initiative wouldn't have been possible without the unwavering support of ITI Australia and Weathertex.

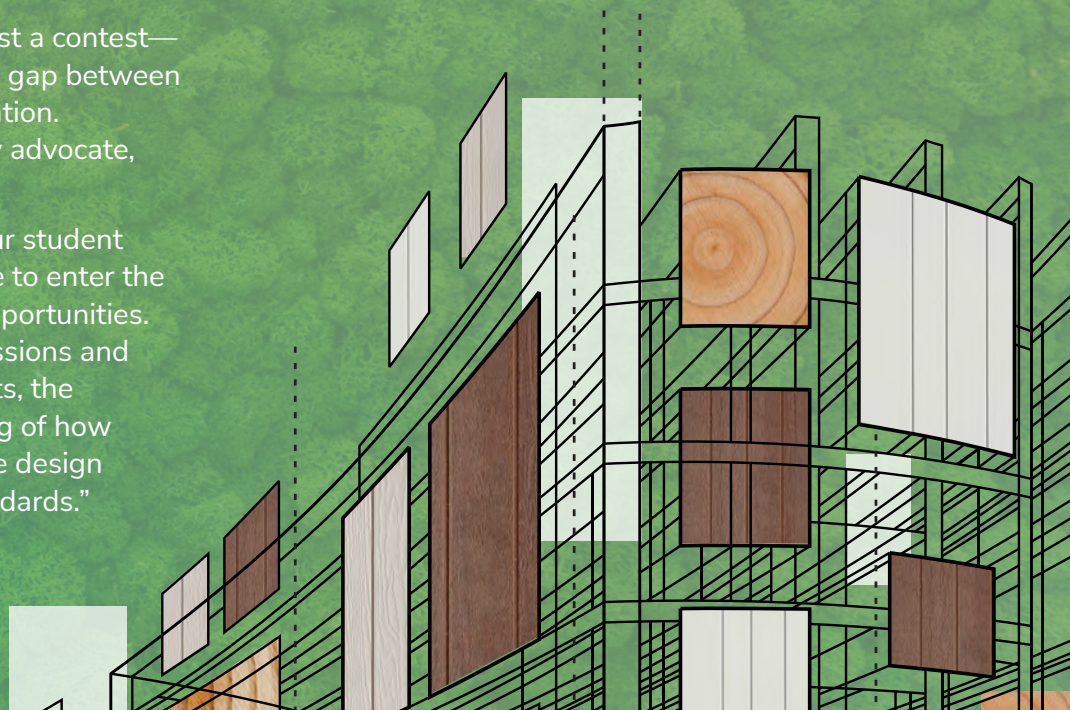


- **ITI Australia:** Known for its innovative approach to timber sourcing and distribution, ITI has become the largest independent distributor of timber products in Australia.



- **Weathertex:** A 100% Australian-owned company, Weathertex has been a leader in timber cladding and architectural panels since 1939, widely respected by builders, architects, and designers globally.

Together, these partners exemplify a commitment to fostering sustainability and supporting education in building design.





# Sustainability at Weathertex

Timber is the ultimate renewable resource and all Weathertex products are made from 97% hardwood and 3% paraffin wax. Weathertex primed products are finished with a water-based lead-free acrylic primer. All eathertex boards are manufactured using waste timber sourced from Australian, PEFC-certified harvesters. No old growth hardwood is ever used, so there's minimal environmental impact and avoids depletion of natural resources. Weathertex timber product is the only product of its kind in the world containing absolutely no artificial glues or binders.

Weathertex is a family owned Australian manufacturing cladding company, operating in NSW since 1939. No toxic or polluting chemicals are required when making Weathertex products. The manufacturing process of

all Weathertex products minimises waste by-products through resource recovery systems. This includes creating compost, using the offcut board as fuel, creating briquettes and using it as packaging. Weathertex's on-site water management system is unique and highly sustainable, it reduces water usage by ensuring processed water is treated and recycled. Weathertex has a better than ZERO carbon footprint – making it a sustainable choice!

Like most timber products, Weathertex can be reused/repurposed for various usages – other construction applications, recycled into packaging, used as fuel or turned into compost. Even in landfill, Weathertex does not rot/breakdown, so the carbon stored in it will remain contained indefinitely.

## What Are the Benefits of Using Weathertex?

### Made in Australia

Family owned and manufactured in the Hunter region, NSW since 1939.

### Trusted

Weathertex voted #1 MOST TRUSTED brand in the building industry by Architecture & Design 2016-18. Won SUPPLIER OF THE YEAR in the Australian Construction Awards.

### Sustainable

Better than zero carbon footprint with Third Party Credentials - GreenTag certification. Low embodied energy.

### Durable

Termite Resistant. Warranty tried and tested not to rot, split or crack for up to 25 years. Natural range is the only timber product in the market to provide a 10 year warranty. 1000 kg/m<sup>3</sup> product density with a minimum 32MPa rating. Watertight - no silicone controlled joints required. Mechanical flashing system.

### Value for Money

No special tools required for cutting. Large panels and lower wastage costs on Weathergroove Range. Lightweight product - reduces labour costs.

### Quick & Easy Installation

Larger panels for quick installation. 9.5mm thickness and matching accessories across all products making it easier to mix multiple profiles within a project. Easier to paint than other materials on the market due to its smoother surface.

### Safe

Low VOC. Meets Australian Building Standards. 100% natural product. No added silica, glues, resins or formaldehydes.

### Stylish Choices

A wide selection of profiles available in various styles, textures and sizes. Easy to incorporate the natural with primed profiles together to offer multiple design options.

○ Like most timber products, Weathertex can be reused/ repurposed for various usages –

other construction applications, recycled into packaging, used as fuel or turned into compost.



## Weathertex Accreditations

### CodeMark Certified

The CodeMark Certification Scheme (the Scheme) is a voluntary third-party building product certification scheme that authorises the use of new and innovative products in specified circumstances in order to facilitate compliance with Volumes One and Two of the NCC, also known as the Building Code of Australia or BCA. CodeMark is also useful for products like Weathertex (which have been on the market for many years) because it provides our customers with a shorthand summary of the various NCC standards that Weathertex products meet/exceed.



### PEFC Certified

The Programme for the Endorsement of Forest Certification (PEFC) is an international non-profit, non-governmental organization dedicated to promoting Sustainable Forest Management (SFM) through independent third-party certification.



PEFC works throughout the entire forest supply chain to promote good practice in the forest and to ensure that timber and non-timber forest products are produced with respect for the highest ecological, social and ethical standards. Thanks to its eco-label, customers and consumers are able to identify products from sustainably managed forests.



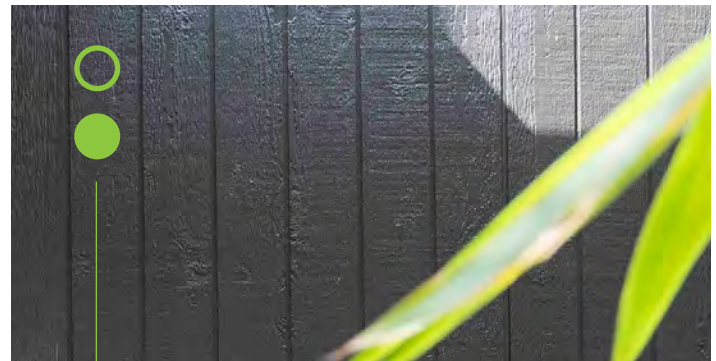
### Global GreenTag

Weathertex have been through a rigorous evaluation from Global GreenTag Pty Ltd to determine their outstanding “green performance” and we are proud to announce we are the FIRST manufactured product to receive a GreenTag Platinum certification with a GreenRate R Level A for our natural range products.

Additionally, we’ve received Gold certification for our primed flat cladding and wall panel sheets. Ecospecifier Global GreenTagCert™ is a third party, multi-criteria, consensus based and externally verified Type 1 ecolabelling program. One of the largest product sustainability certification systems in Australia and globally. GreenTag is the only Certification Mark in the sector approved by the Australia Competition and Consumer Commission (ACCC), the US Patents and Trademarks Office and green building rating tools, across the globe.

### Product Health Declaration

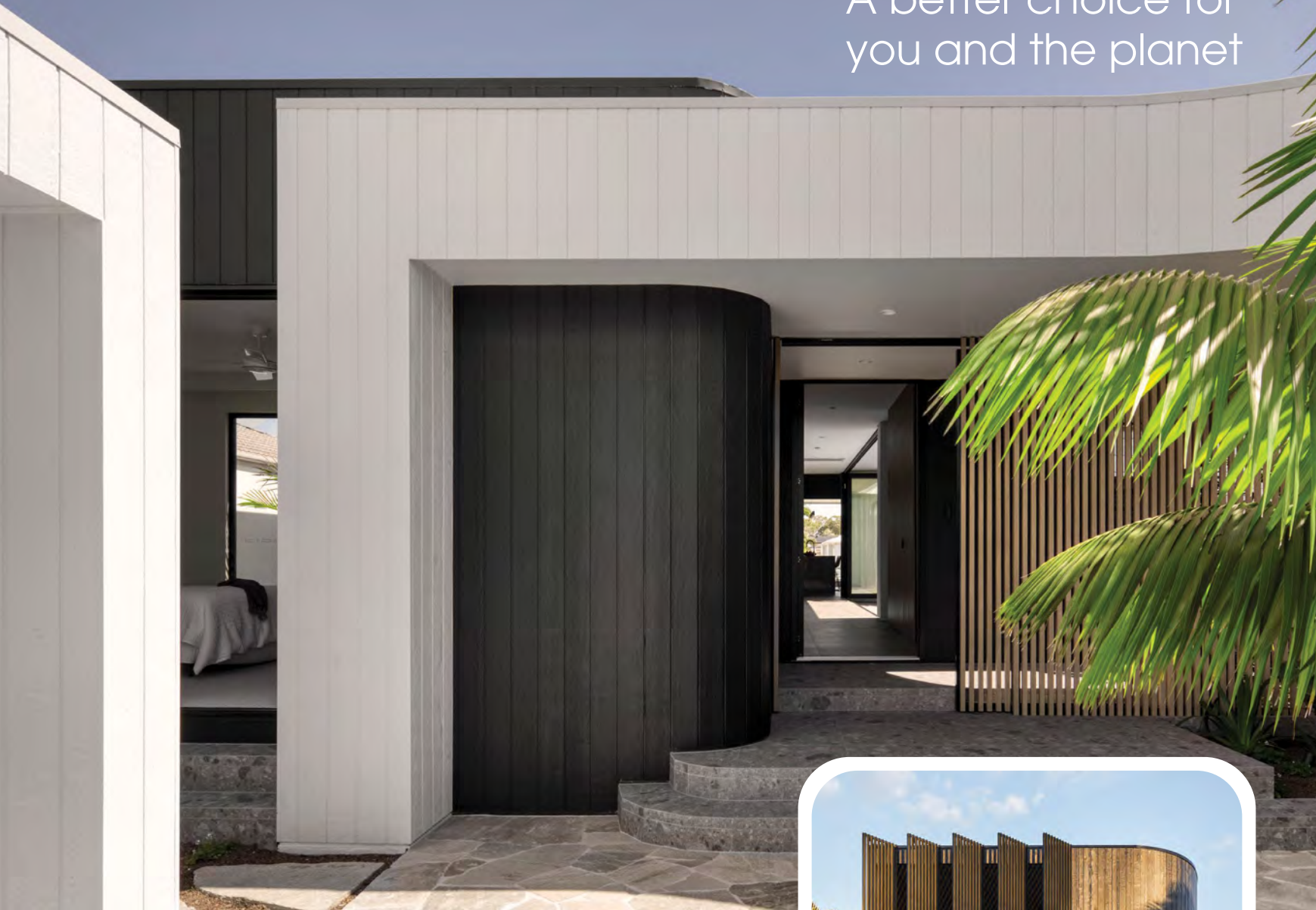
“Studies that make connections between toxic products and human health issues speak for themselves,” says David Baggs, CEO and Technical Director of Global GreenTag, at the launch of the ecolabel’s new Product Health Declaration™ or PhD tool in Sydney at Total Facilities 2017. Ethically, GreenTag did not want to sit on worrying statistics much longer without doing something about it. “GreenTag’s PhD is a radical entry into the market but it is also very necessary because it addresses human health concerns directly – we have the first system globally to assess the health impacts of the final product – and not just the hazards of the ingredients.”



## Less Than Zero Carbon Footprint

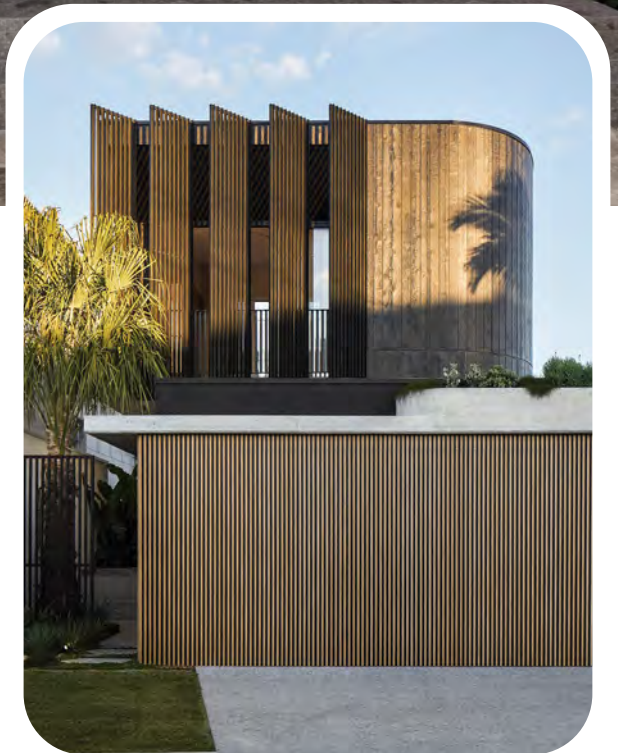
Weathertex’s factory creates less carbon footprint during the manufacturing process than the timber product can absorb and store, making Weathertex better than zero carbon footprint. Weathertex products are perfect for the changing global environment as it has minimal impact, improves the reduction of carbon footprint as well as having a long life span.

A better choice for  
you and the planet



## SLEEK CURVES, TOUGH CLADDING.

- ✓ Australian made and owned.
- ✓ Better than zero carbon footprint.
- ✓ 100% natural: 97% natural timber and 3% natural wax.
- ✓ Termite resistant: all sugars and starches removed.
- ✓ No added silica, glues, resins or formaldehydes.
- ✓ CodeMark accredited & Global GreenTag™ certified.



**FREE ONLINE sample service.**

Simply go to [weathertex.com.au](https://www.weathertex.com.au) for cladding you can trust, *naturally.*

# Adapting to Change

## MODERN VENTILATION NEEDS IN AUSTRALIAN DESIGN

The conversation around indoor air quality and ventilation has undergone a seismic shift in recent years. From a global pandemic to the increasing frequency of extreme weather events, the need for effective, sustainable ventilation systems has never been greater. In Australia, where diverse climates and unique challenges intersect with modern building practices, the conversation is particularly pressing. How can we design for comfort, safety, and efficiency in a way that meets Australia's distinct needs?

This article explores the evolving role of ventilation in Australian buildings, drawing on global insights while tailoring strategies to the local market.

---

### The Global Shift in Ventilation Standards

Around the world, the importance of indoor air quality has grown significantly. In regions where poor ventilation has been linked to health crises, there's been a push toward higher standards and innovative technologies. Mechanical systems with built-in air filtration, demand-controlled ventilation, and air quality sensors are now becoming standard in many parts of the world.

For Australian designers, these global advancements provide a useful framework. Yet the question remains: how can these systems be optimised for Australia's diverse climates and regulatory environment?

### Australia's Ventilation Landscape

Australia's approach to ventilation is heavily influenced by the country's National Construction Code (NCC), which outlines minimum standards for air quality and energy efficiency. However, the "minimum" is no longer enough. Designers are recognizing that buildings must not only meet code requirements but also address regional challenges.

For example:

- **Tropical North:** Humidity is a major concern, making systems like dehumidifiers and mechanical ventilation with heat recovery (MVHR) essential.
- **Arid Interior:** High temperatures and dusty conditions necessitate robust filtration systems and shading strategies.
- **Urban Centres:** In cities like Sydney and Melbourne, poor air quality from vehicle emissions and bushfire smoke has amplified the need for advanced filtration systems.



# Our Sustainable Journey So Far



Sustainability is fundamental and integrated into everything we do - from our manufacturing processes to how we deliver our products to customers.

We are continuously seeking better ways to reduce our carbon footprint and over the past years, we've made significant improvements by updating our processes, reducing factory emissions, and emphasising recycling, all the way from raw materials to packaging. It's a key pillar of our business strategy and will remain a central focus as we move forward, guiding our innovation and growth.

Our recently launched Zen indoor/outdoor collection is another example of our forward thinking. Produced using 316L stainless steel is an exceptional material choice for tapware design due to its remarkable resilience and corrosion resistance, even in harsh environments. From a product functionality point of view, this ensures longevity and prime performance of our "Zen" range even in coastal areas or places with particularly high humidity. Its inherent strength allows it to withstand daily wear and tear, ensuring that our tapware remains in pristine condition for years to come.



The material boasts a sleek and modern quality, which perfectly expresses the design philosophy behind the collection, with clean lines and polished finish elevating any bathroom space with its refined and minimalist aesthetic. At the same time, on top of the environmental benefits of the material itself, the exclusive use of lead-free components ensures that our products are safe for both our customers and the environment.

One of the key aspects of our sustainability agenda is our focus on longevity. By designing products that are durable and built to last - like the "Zen" collection - we help reduce the frequency of replacements and, ultimately, minimise waste. We also encourage the adoption of water-efficient solutions, which are critical in helping households and businesses conserve one of our most precious, life-giving resources.



Click to see **Nero Zen** collection

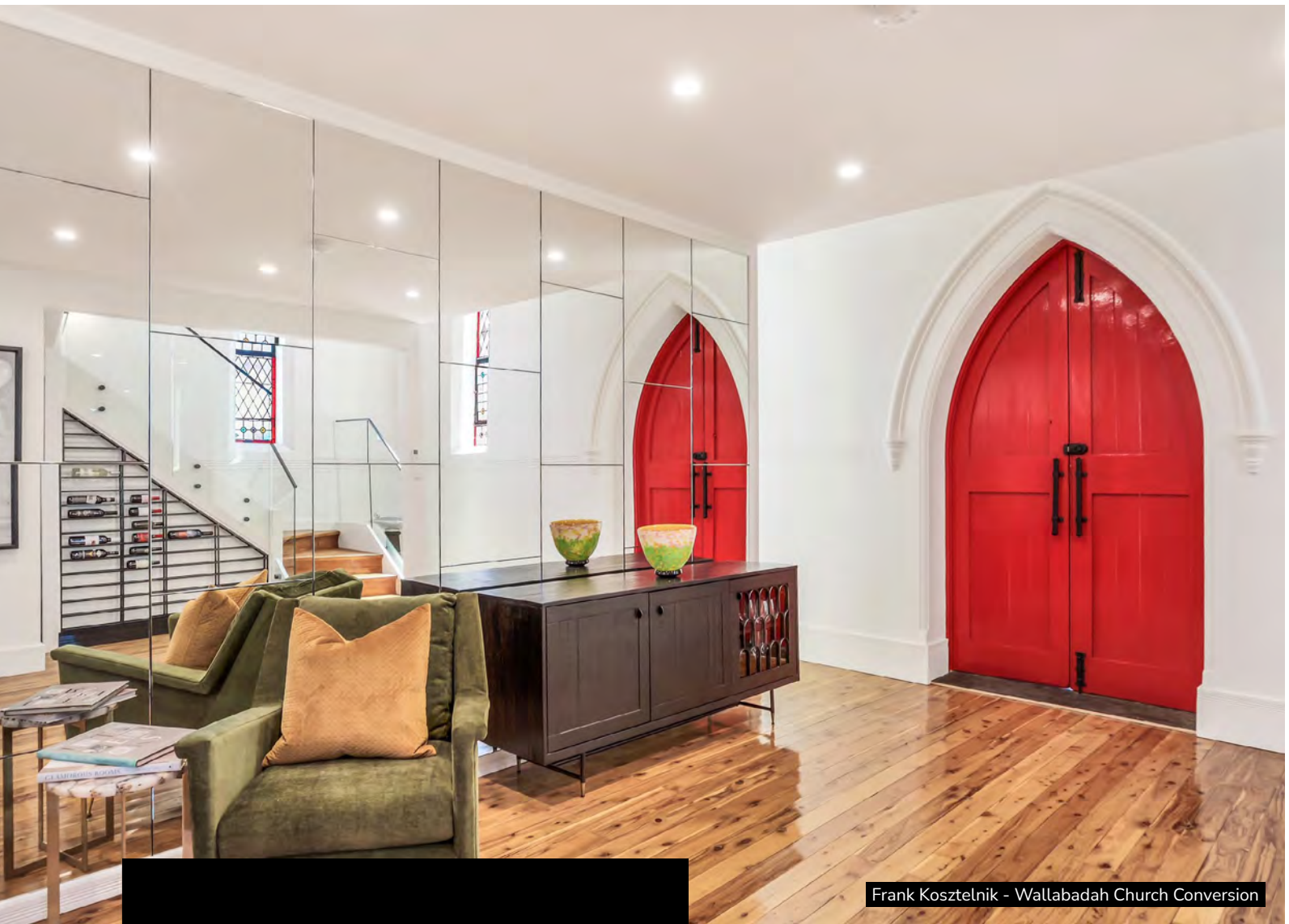
# Step Into Sustainability

FLOORING THAT'S KIND TO THE PLANET

Sustainable flooring isn't just a trend—it's a movement reshaping how we think about the spaces we inhabit. As the building and design industries lean further into eco-friendly solutions, flooring options have become a focal point for their ability to marry function, aesthetics, and environmental responsibility.

Graeme Bakker - Modern Farmhouse





Frank Kosztelnik - Wallabadah Church Conversion

But what makes a flooring material truly sustainable? It's about more than just using natural or recycled materials. It's about responsible sourcing, manufacturing processes, and durability that ensures the material will stand the test of time. Let's explore the options leading the charge in sustainable flooring and why they deserve a place in your next project.

## The Classic Charm of Hardwood

Hardwood has long been a staple of timeless interior design. But today's sustainable hardwood flooring takes the tradition a step further. By choosing products certified by the Forest Stewardship Council (FSC), designers can ensure the wood comes from responsibly managed forests.

Another sustainable strategy? Refinishing existing hardwood. Instead of tearing up floors, consider sanding, staining, and sealing what's already there. It's a low-impact solution that brings out the natural beauty of the material while minimising waste.

## Bamboo: The Fast-Growing Favourite

Bamboo flooring is the darling of sustainability advocates—and for good reason. Unlike hardwood, which takes decades to mature, bamboo can be harvested in as little as five years. Its rapid renewability makes it a standout choice, but it's not just about speed. Bamboo offers exceptional durability and a sleek, modern aesthetic that pairs beautifully with minimalist design.

However, not all bamboo flooring is created equal. To ensure a truly sustainable product, look for options free from harmful adhesives, like urea-formaldehyde, which can compromise indoor air quality.

## Cork: Comfortable and Eco-Friendly

If you're looking for a material that feels as good underfoot as it does for the planet, cork might be your answer. Harvested from the bark of cork oak trees without harming the tree itself, this material is a masterclass in renewability. Cork flooring is naturally antimicrobial, fire-resistant, and provides excellent insulation—making it a standout choice for both residential and commercial spaces.

Its springy texture also absorbs impacts, making it a more comfortable option for areas where people spend long hours standing.

## The Return of Linoleum

For many, linoleum evokes images of outdated kitchens and drab colours. But modern linoleum is experiencing a resurgence, and it's nothing like its mid-century predecessor. Made from natural materials like linseed oil, wood flour, and jute, linoleum is biodegradable, durable, and hypoallergenic.

Designers are embracing linoleum for its versatility and vibrant colour options, which can add a bold touch to contemporary spaces while staying true to eco-friendly principles.

## Reclaimed Wood: A Story Beneath Your Feet

When it comes to sustainability, reclaimed wood flooring is a win-win. By repurposing timber from old buildings, barns, or even wine barrels, designers not only reduce waste but also add a unique, storied element to their projects. Each plank carries a history, creating a look that's impossible to replicate with new materials.

Reclaimed wood celebrates the beauty of imperfections—knots, weathering, and patina become design features rather than flaws.

## Sustainability Meets Innovation

Today's sustainable flooring options aren't limited to the traditional. Materials like recycled rubber, Polygood panels made from plastic waste, and Botanol—an innovative blend of canola oil and chalk—are pushing the boundaries of what's possible. These modern solutions offer durability and performance while addressing some of the most pressing environmental issues, such as plastic pollution and carbon emissions.



## Making the Right Choice

Choosing the right flooring for a project is about balancing aesthetics, performance, and environmental impact. Designers should consider:

- **Durability:** A longer lifespan reduces the need for replacements.
- **Low VOC Emissions:** Prioritising materials that support healthy indoor air quality.
- **Responsible Sourcing:** Opting for renewable or recycled materials wherever possible.

Flooring sets the tone for a space, grounding the design and influencing how it feels. By choosing sustainable options, we not only enhance our interiors but also contribute to a healthier, more sustainable future for the planet. The next time you walk into a beautifully designed room, take a moment to look down. The floor beneath your feet might just be the quiet hero of sustainable design.

# THE POWER OF Pre-Construction

## PLANNING: IN SUSTAINABLE DESIGN

Sustainability in the built environment doesn't just happen on-site—it begins with the decisions made long before the first shovel hits the ground. In today's construction landscape, effective pre-construction planning plays a pivotal role in delivering sustainable, resilient projects that meet both environmental and economic goals.

### Designing for Efficiency

The foundation of a sustainable building lies in thoughtful design and early-stage planning. Incorporating strategies like passive design, energy modelling, and material efficiency during the pre-construction phase ensures resources are used wisely and waste is minimised.

- **Passive Design:** Leveraging natural light, ventilation, and insulation to reduce the need for mechanical heating and cooling.
- **Material Optimisation:** Selecting durable, recyclable, or locally sourced materials to lower embodied carbon and transportation impacts.
- **Site-Specific Solutions:** Factoring in environmental conditions, such as solar orientation, soil stability, and water management, reduces risks and long-term environmental strain.

### Sustainability Through Engineering

Smart engineering solutions are the backbone of sustainable construction. Civil and geotechnical planning address critical areas like stormwater management, erosion control, and structural integrity while reducing environmental impact. For example:

- **Stormwater Systems:** Implementing retention basins, permeable pavements, and rainwater harvesting to manage runoff and conserve water.
- **Reduced Excavation and Waste:** Designing structures to work with the natural topography can minimise heavy earthworks, preserving habitats and saving energy.

### The Circular Economy Advantage

Pre-construction planning also allows for a focus on the circular economy—a model where materials are selected and designed for reuse, recycling, and minimal waste. By choosing systems that enable future disassembly or repurposing, buildings can evolve alongside changing needs, reducing demolition waste. This approach ensures that buildings remain assets rather than liabilities to the environment, with components that can outlast their original use and be integrated into future projects.

### A Holistic Mindset for Tomorrow

Beyond the immediate environmental benefits, pre-construction sustainability planning brings measurable advantages for developers, builders, and occupants.

- Lower operational costs through energy-efficient designs.
- Enhanced project resilience against climate risks.
- Improved building performance over its lifespan, contributing to long-term value.

By prioritising sustainability at the earliest stages, projects can align environmental stewardship with functionality, resilience, and design excellence. As the built environment evolves, the future of construction will rely on thoughtful pre-construction planning to address the challenges of climate change, resource scarcity, and rising energy demands. In a rapidly changing world, sustainable design begins with preparation—because the choices made today will define the spaces of tomorrow.

BIM QUALIFIED | COLLABORATIVE APPROACH | LICENSED NATIONWIDE\*

# THE HOME OF ENGINEERING FOR DESIGN

Get ahead of the build with comprehensive and efficient pre-construction you can count on.

- Structural engineering ■ Civil engineering ■ Bushfire
- Geotechnical ■ Residential ■ Commercial



Book a free consultation to  
discuss your next project

[hed-consulting.com.au](https://hed-consulting.com.au)

\*for structural and civil engineering





JAMES HARDIE'S

# Proudly Australian Made

**A COMMITMENT TO LOCAL INNOVATION,  
SUSTAINABILITY AND BEYOND**

For more than a century, James Hardie has been synonymous with quality, innovation, and resilience in the Australian building materials industry. Now, with the launch of the Australian Made Campaign, the company is reaffirming its deep-rooted commitment to supporting local industries, empowering Australian builders, and addressing the unique challenges of the nation's diverse climates.

## Why Australian Made Matters

In a world increasingly focused on sustainability and accountability, the importance of locally made products has never been greater. By manufacturing its iconic fibre cement products right here in Australia, James Hardie not only ensures the highest standards of quality but also supports the local economy and reduces the environmental impact of transportation.

“Australia is a unique place, with unique needs. Our commitment to being Australian Made is about more than just manufacturing—it’s about designing and delivering products that reflect the distinct conditions and expectations of our communities,” says Luke Cheng, Trade Marketing Manager at James Hardie.

## Designed for Australia’s Harsh Conditions

From the blistering heat of the outback to the humidity of coastal regions, Australian homes face some of the most extreme conditions in the world. James Hardie’s locally made cladding and construction materials are engineered specifically to meet these challenges. Products like Hardie™ Fine Texture Cladding and the Hardie™ Smart Fire & Acoustic Boundary Wall System are tailored for Australia’s demanding environment, offering durability, thermal efficiency, and bushfire resistance.

“Our Australian Made approach ensures that we don’t just meet industry standards—we set them,” explains Luke. “Every product is designed with Australia’s evolving climate in mind, providing solutions that builders and homeowners can rely on.”

## Supporting Local Communities

James Hardie’s Australian Made Campaign is more than a manufacturing pledge, it’s a promise to foster growth and innovation within local communities. By sourcing materials and employing Australians in their production facilities, the company is creating jobs, advancing skills, and contributing to a sustainable economy.

This commitment extends to environmental responsibility, with James Hardie investing in cutting-edge facilities like the Carole Park water treatment plant, designed to reduce wastewater discharge by at least 50%. Initiatives like this demonstrate the company’s dual focus on local impact and global sustainability.

## Building with Confidence

For builders, designers, and homeowners, choosing Australian-made products means choosing peace of mind. James Hardie’s Australian Made products undergo rigorous testing to ensure they can withstand the harshest conditions while delivering on performance, aesthetics, and environmental standards.

The campaign also promotes accountability - by keeping production close to home, James Hardie ensures transparency at every stage, from design to delivery. This commitment resonates with customers who are increasingly prioritising sustainable and ethically sourced materials.

## A Future Built on Local Expertise

As Australia’s construction industry continues to evolve, the importance of local manufacturing will only grow. James Hardie’s Australian Made Campaign is a testament to the power of homegrown innovation, combining the company’s global expertise with its dedication to local excellence.

“We’re proud to call Australia home,” says Luke. “With the Australian Made Campaign, we’re not just building homes—we’re building a stronger, more sustainable future for our country.”



## Australian Made. Built to Last.

When it comes to creating durable, sustainable, and beautiful homes, there’s no substitute for local expertise. With its Australian Made Campaign, James Hardie is leading the way in delivering products that meet the unique needs of Australians while driving local industry forward.

# The Cool Factor

In a sun-soaked country where summer temperatures can soar, the importance of thermal efficiency in building materials cannot be overstated. Enter Lysaght roofing solutions—a brand synonymous with innovation and durability, offering Australian homes a cooler and more energy-efficient way to beat the heat.



## Harnessing the Power of COLORBOND® Steel

At the heart of Lysaght's thermal efficiency lies COLORBOND® steel—a material engineered for Australia's unique climate conditions. Featuring Thermatech® solar reflectance technology, Lysaght's roofing solutions reflect a significant portion of the sun's heat. This reduces the amount of heat absorbed by the roof, leading to cooler indoor temperatures and less reliance on energy-intensive air conditioning.

In practical terms, homes with COLORBOND® steel roofing can experience:

- Reduced cooling costs during summer months.
- A more comfortable living environment without excessive energy use.
- Decreased heat stress on the roof, prolonging its lifespan.

## Light Colours for Maximum Reflection

The science of thermal efficiency extends to the colour palette. Lighter colours in the COLORBOND® range—like Surfmist®, Shale Grey™, and Classic Cream™—are particularly effective at reflecting solar radiation. These shades qualify as solar reflective roofing under the Green Star Communities tool, making them ideal for sustainable construction.

But even the darker colours in the range benefit from Thermatech® technology, ensuring that all Lysaght roofing products contribute to improved energy efficiency regardless of aesthetic preference.

## The Sustainability Edge

Beyond thermal efficiency, Lysaght roofs also shine in sustainability. Manufactured using 100% Australian-made metallic coated and pre-painted steel, the products are:

- **Durable:** With a long lifespan, Lysaght roofs reduce the need for replacements, conserving resources over time.
- **Recyclable:** The steel used in Lysaght products is 100% recyclable and often reusable without reprocessing.
- **Eco-friendly:** Incorporating recycled content, these products align with modern sustainability standards.

## Benefits for Builders and Homeowners

For builders, Lysaght's lightweight steel roofing simplifies installation and reduces structural requirements, leading to faster project timelines and lower costs. Homeowners benefit from a roof that is not only aesthetically versatile but also enhances the home's overall energy performance.

Whether you're building in the suburbs or along the rugged coastline, Lysaght roofing provides options tailored to Australia's diverse environmental conditions, including products designed for extreme marine or industrial areas.

## A Cooler, Smarter Future

In the quest for thermal efficiency and sustainable living, Lysaght roofing stands out as a leading choice for Australian homes. By reflecting more heat, reducing energy consumption, and offering unmatched durability, Lysaght helps homeowners stay cool and eco-conscious—one roof at a time.



**LYSAGHT**

# EMBRACE NATURE WITH LYSAGHT®

Delivering the benefits of durable, Australian-made cladding shaped from COLORBOND® steel, LYSAGHT® steel solutions offer both beauty and functionality. Trust Lysaght for innovative product solutions to enable designs that harmonise with nature, creating spaces that promote tranquillity and enhance your lifestyle.



**TO READ MORE ABOUT LYSAGHT AND BIOPHILIC DESIGN,  
SCAN THE QR CODE HERE.**

COLORBOND®, LYSAGHT® and ® product names are registered trademarks of BlueScope Steel Limited and ™ product names are trademarks of BlueScope Steel Limited. © 2024 BlueScope Steel Limited. ABN 16 000 011 058. All rights reserved. LYH2463 - 11/24

**LYSAGHT.COM**



# Smart Buildings, Smarter Energy Use

AI AND MACHINE LEARNING FOR OPTIMISATION

Imagine a building that anticipates your needs, adjusting lighting, heating, and cooling automatically to ensure optimal comfort and energy efficiency. This is the promise of smart buildings, where artificial intelligence (AI) and machine learning are transforming how we interact with the built environment.

## The Power of AI and Machine Learning

AI and machine learning algorithms can analyse vast amounts of data from various sources, such as building sensors, weather forecasts, and occupancy patterns, to identify trends and predict future energy needs. This allows for proactive energy management, optimising building systems in real-time to minimise energy consumption without sacrificing occupant comfort.

### Optimising Building Performance

- **Predictive Maintenance:** AI can predict equipment failures before they occur, enabling proactive maintenance and preventing costly downtime. This not only saves energy but also extends the lifespan of building systems.
- **Automated Controls:** Machine learning algorithms can optimise heating, ventilation, and air conditioning (HVAC) systems, adjusting settings based on occupancy, weather conditions, and time of day. This ensures optimal thermal comfort while minimising energy waste.
- **Demand Response:** AI can enable buildings to participate in demand response programs, reducing energy consumption during peak demand periods and contributing to grid stability.
- **Intelligent Lighting:** AI-powered lighting systems can adjust lighting levels based on occupancy and natural light availability, reducing energy consumption and creating a more comfortable environment.

### Real-World Applications

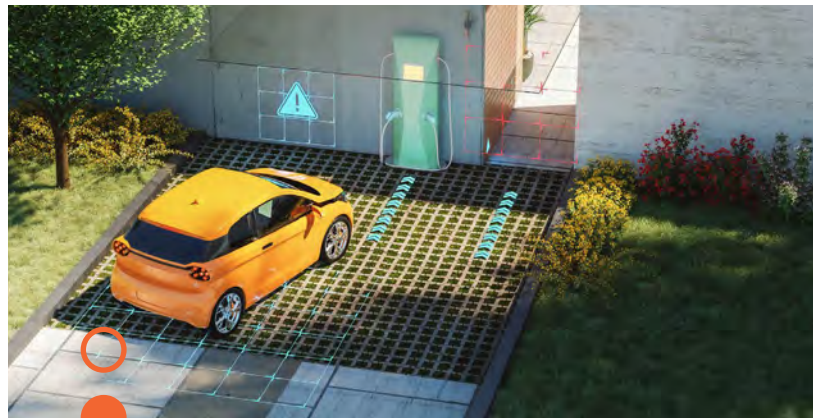
- **Office Buildings:** AI can optimise energy use in office buildings by adjusting lighting and HVAC systems based on occupancy patterns and employee preferences.
- **Retail Spaces:** AI can help retailers optimise energy use in their stores by adjusting lighting and HVAC systems based on customer traffic and store hours.
- **Hospitals:** AI can help hospitals optimise energy use in critical areas like operating rooms and intensive care units, ensuring patient safety and comfort while minimising energy waste.
- **Schools:** AI can help schools optimise energy use by adjusting lighting and HVAC systems based on classroom schedules and occupancy.

## Benefits of AI-Powered Energy Management

- **Reduced Energy Costs:** AI can significantly reduce energy consumption, leading to lower energy bills and operating costs.
- **Improved Sustainability:** By optimising energy use, AI helps to reduce greenhouse gas emissions and promote environmental sustainability.
- **Enhanced Occupant Comfort:** AI can create a more comfortable and productive indoor environment by optimising lighting, temperature, and air quality.
- **Increased Building Value:** Smart buildings with AI-powered energy management systems are often more valuable and attractive to tenants and investors.

## Challenges and Considerations

- **Data Security:** Protecting sensitive building data is crucial, requiring robust cybersecurity measures.
- **Integration Complexity:** Integrating AI and machine learning into existing building management systems can be complex, requiring careful planning and execution.
- **Cost:** Implementing AI-powered energy management systems can involve upfront costs, but the long-term benefits often outweigh the initial investment.



AI and machine learning are revolutionising building energy management, offering a powerful toolkit for optimising building performance, reducing energy consumption, and enhancing occupant comfort. As technology continues to advance, we can expect even more innovative applications of AI in the built environment, paving the way for a more sustainable and intelligent future.

# HÄFELE



Proud supporter of  
**SPECIALIST  
DISABILITY  
ACCOMMODATION  
ALLIANCE**



## SCAN TO VIEW OUR RANGE. BY HÄFELE

A liveable and adaptable built environment is one that can effectively respond to the changing needs of an individual without the need for costly and energy intensive alteration. It must also provide independence for the individual.

Häfele Australia are the leading specialists and producers of assistive technology for accessibility in Aged Care and Retirement Living, Home Modification and the NDIS Specialist Disability Accommodation sector.

[www.hafele.com.au](http://www.hafele.com.au)  
[info@hafele.com.au](mailto:info@hafele.com.au)  
1300 423 353

Visit your nearest Häfele Showroom: BRISBANE - NEWCASTLE - SYDNEY - MELBOURNE - LAUNCESTON - HOBART - ADELAIDE - PERTH

## Post-Pandemic Ventilation Priorities

The COVID-19 pandemic brought indoor air quality to the forefront of public health. Schools, workplaces, and public buildings have since invested in ventilation systems designed to reduce the spread of airborne pathogens. In Australia, this shift was particularly visible in education and healthcare sectors, where upgrades have ranged from increasing outdoor air intake to installing air purification systems.

This period also sparked innovation, with many Australian companies exploring how to design spaces that naturally promote air circulation. Hybrid systems that combine mechanical ventilation with operable windows are becoming popular, balancing health with energy efficiency.

## Sustainability and Ventilation

Australia's commitment to sustainability has positioned energy-efficient ventilation as a key priority. Buildings that rely heavily on air conditioning or mechanical ventilation are under scrutiny for their high energy consumption, leading to greater interest in passive design strategies.

Designers are increasingly incorporating:

- **Passive Ventilation:** Harnessing Australia's coastal breezes through strategically placed windows and ventilation pathways.
- **MVHR Systems:** These systems are gaining traction as they not only improve air quality but also reduce heating and cooling energy demands.
- **Green Roofs and Vegetation:** By cooling surrounding air, these features reduce the strain on ventilation systems.

## Future Trends in Australian Ventilation

Looking ahead, Australian buildings will likely adopt more smart ventilation solutions. Systems integrated with sensors can automatically adjust airflow based on occupancy, temperature, and air quality metrics. This approach not only improves comfort but also reduces energy consumption.

Another promising trend is the integration of renewable energy sources. Solar-powered ventilation systems are emerging as a viable solution for off-grid buildings, particularly in remote and rural areas.



Martin Freney - Earth One

Australia's changing climate, diverse geography, and evolving construction practices demand a nuanced approach to ventilation. By embracing innovations in technology and prioritizing sustainability, the Australian design community has the opportunity to lead the way in creating healthier, more resilient buildings.

For designers, the challenge is clear: ventilation must no longer be an afterthought. Instead, it should be a cornerstone of design, tailored to Australia's unique environment. Let's breathe new life into our built spaces—one system at a time.

QUALITY HOME LIFTS

# ELEVATE YOUR HOME LIVING EXPERIENCE

Discover effortless mobility and independence within your home with our sophisticated lifts, designed for those who value comfort and convenience.



**Velocity**  
HOME LIFTS



- ▶ Australian Made
- ▶ Short Lead Time
- ▶ No masonry walls; self-supporting structure
- ▶ Full Electric; no machine room
- ▶ 25 Year Warranty



**Need a Home Lift Specialist?**  
Call 1300 008 607  
[craig@velocityhomelifts.com.au](mailto:craig@velocityhomelifts.com.au)  
[velocityhomelifts.com.au](http://velocityhomelifts.com.au)

# Understanding the Thermal Envelope

## MAXIMISING INSULATION AND MINIMISING LOSS

In the pursuit of energy-efficient buildings, the thermal envelope plays a pivotal role. Comprising the building's outer shell—including walls, roofs, windows, and floors—the thermal envelope acts as a barrier against external temperature fluctuations, directly influencing indoor comfort and energy consumption.

### The Importance of a Robust Thermal Envelope

A well-designed thermal envelope minimizes heat transfer between the interior and exterior environments. This reduction in heat exchange decreases the demand on heating and cooling systems, leading to significant energy savings. Studies indicate that proper insulation can reduce energy demand for heating by 43–83% by controlling the U-value, a measure of thermal transmittance.

○ **Geothermal systems**  
● **can increase the value of a home,**  
making it more attractive to potential buyers.

### Strategies for Enhancing the Thermal Envelope

- **Insulation:** Installing appropriate insulation materials in walls, roofs, and floors is crucial. Materials such as expanded polystyrene (EPS) have been shown

to significantly reduce a building's energy performance when added to concrete structures.

- **Air Sealing:** Identifying and sealing gaps, cracks, and openings prevents unwanted air infiltration, which can compromise insulation effectiveness.
- **High-Performance Windows:** Utilizing double or triple-glazed windows with low-emissivity coatings reduces heat loss and gain, enhancing overall thermal performance.
- **Thermal Bridging Mitigation:** Addressing areas where conductive materials create pathways for heat transfer—such as metal studs or concrete beams—prevents thermal bridging, which can undermine insulation efforts.

### Benefits of an Optimized Thermal Envelope

Enhancing the thermal envelope not only reduces energy consumption but also improves indoor comfort by maintaining consistent temperatures. Additionally, it contributes to lower greenhouse gas emissions, aligning with sustainability goals and regulatory requirements.

Investing in the optimisation of a building's thermal envelope is a critical step toward achieving energy efficiency and sustainability in the built environment.





JAMES HARDIE:

# Paving the Way for ESG Excellence

**IN AUSTRALIA AND BEYOND**

In a world where sustainability is no longer optional, James Hardie stands out as a beacon of progress in the Australian building materials sector. While Australia may have been late to join the ESG party, James Hardie's global presence has positioned it at the vanguard of sustainable practices, setting new benchmarks for the industry both at home and abroad.

## A Decade of Dominance

For ten consecutive years, Australia's property industry has maintained its world-leading position in environmental, social, and governance (ESG) performance, as measured by the Global Real Estate Sustainability Benchmark (GRESB). This achievement is no small feat, and James Hardie has played a pivotal role in this success story.

### Ambitious Goals, Tangible Results

James Hardie's commitment to sustainability is not just talk—it's action. The company has set ambitious targets that go beyond mere compliance:

- A 42% absolute reduction in Scope 1+2 GHG emissions by 2030
- Zero manufacturing waste to landfill by 2035
- Recycling an additional 20 million cubic feet of water per year by 2030

These goals are not just numbers on paper. In fiscal year 2024, James Hardie reduced its Scope 1+2 emissions by 10% from its 2021 baseline, demonstrating real progress towards its targets.



## Innovation at the Core

James Hardie's approach to sustainability is deeply intertwined with innovation. The company is advancing a Low Carbon Cement Technology Roadmap, aiming to reduce the CO<sup>2</sup> impact of its fibre cement products by at least 50%. This initiative showcases how sustainability and product development can go hand in hand, creating solutions that are both environmentally friendly and high-performing.

## Global Recognition, Local Impact

While James Hardie's influence spans the globe, its commitment to local communities remains strong. In Australia, the company is investing millions of dollars in Carole Park to develop one of its most advanced water treatment plants, aiming to cut wastewater discharge by at least half. This project is a testament to James Hardie's dedication to water conservation and its ability to implement global best practices at a local level.

## Setting the Standard

As Australia prepares for mandatory sustainability reporting starting July 1, 2024, James Hardie is already ahead of the curve. The company's comprehensive ESG reporting and transparent communication of its sustainability efforts position it as a model for other Australian businesses to follow.

## A Culture of Sustainability

What sets James Hardie apart is not just its targets or technologies, but its holistic approach to sustainability. The company is fostering a "Culture of Sustainability" that permeates every aspect of its operations, from the boardroom to the factory floor. This cultural shift is driving innovation, improving operational efficiency, and creating long-term value for stakeholders.

In a world where ESG performance is increasingly scrutinized by investors and consumers alike, James Hardie's leadership in this space is not just commendable—it's essential. As Australia catches up with global ESG trends, James Hardie stands as a shining example of what's possible when a company truly commits to building a better, more sustainable future for all.

# Sunflower House

The Sunflower House, conceptualised by Koichi Takada Architects, embodies a harmonious blend of nature-inspired design and sustainable innovation. Commissioned by Bloomberg Green, this climate-positive single-family dwelling is envisioned for Le Marche, Italy—a region celebrated for its rolling farmlands and vibrant sunflower fields.



## Design Inspiration and Concept

Drawing inspiration from the sunflower, known in Italian as “girasole” (literally “turn to the sun”), the Sunflower House emulates the flower’s heliotropic behavior. Its roof and each floor are designed to rotate on sensors, optimizing sun exposure throughout the day. This dynamic movement not only enhances energy generation—yielding an estimated 40% increase in solar power production—but also allows for adaptive thermal comfort, adjusting to seasonal variations to maximize or minimize heat gain.

## Sustainable Features

- **Rotating Structure:** The building’s ability to follow the sun’s path ensures maximum efficiency in solar energy capture, aligning with principles of passive solar design.
- **Natural Air Conditioning:** Employing ancient Roman techniques, the house utilizes earth tubes for cooling. As the sun heats the chimney, rising warm air draws cooler air through subterranean pipes, naturally regulating indoor temperatures.
- **Minimal Ground Impact:** Elevated above the ground, the structure minimizes disruption to the surrounding biodiversity, allowing the landscape to flourish beneath.

## Koichi Takada Architects’ Sunflower House

stands as a testament to innovative, nature-inspired design.

## Architectural Significance

The Sunflower House represents a shift from the industrial ethos of the original Bauhaus movement to a new paradigm where “form follows nature.” By integrating biomimicry and sustainable technologies, it serves as a model for future residential designs that prioritize environmental harmony and occupant well-being.

Koichi Takada Architects’ Sunflower House stands as a testament to innovative, nature-inspired design. By mirroring the sunflower’s relationship with the sun, the dwelling not only achieves aesthetic elegance but also sets a benchmark for sustainable living, aligning with global efforts to combat climate change through thoughtful architectural solutions.





# JOIN BDAA

**For You, For the Industry, For the Future of the Built Environment**



The voice for the building design sphere and everyone who works to fill and define a more sustainable built environment, the Building Designers Association of Australia is a true home for designers and those in related fields.

BDAA offers education, advocacy, representation, national conference and design awards programs, certification, CPD and networking opportunities, and much more.



# Building a Sustainable Future

## INNOVATIONS IN ECO-FRIENDLY CONSTRUCTION

The construction industry, a significant contributor to global carbon emissions, is undergoing a transformation. With the urgent need to combat climate change, sustainable construction technologies are revolutionizing how we build, focusing on eco-friendly materials and energy-efficient practices. These advancements not only reduce the environmental impact but also pave the way for a greener, more resilient future.



Samuel Kassis - Bobe Villas

## Eco-Friendly Building Materials: A New Standard

One of the most exciting developments in sustainable construction is the rise of innovative materials designed with the planet in mind. These materials prioritize durability, energy efficiency, and recyclability, creating buildings that are kinder to the environment without sacrificing functionality.

- **Recycled and Repurposed Materials**  
Construction now includes materials like recycled steel, reclaimed wood, and crushed concrete, reducing the demand for virgin resources. These materials significantly cut down the embodied carbon footprint of a project.
- **Bio-Based Materials**  
Products like hempcrete, mycelium-based composites, and bamboo are gaining traction for their renewability and carbon-negative properties. For instance, hempcrete sequesters more carbon dioxide than it emits during production, making it an ideal choice for sustainable building.
- **High-Performance Insulation**  
Emerging insulation options, such as aerogels and sheep wool, not only reduce heat transfer but are also biodegradable, further aligning with eco-friendly goals.

## Technological Innovations Driving Change

Advancements in technology are playing a critical role in enabling sustainable construction, ensuring buildings are designed, constructed, and maintained with precision and efficiency.

- **Building Information Modeling (BIM)**  
BIM technology allows for meticulous planning and analysis of a project's environmental impact. By simulating energy use, water efficiency, and material optimization, BIM supports decision-making that aligns with sustainability goals.
- **3D Printing in Construction**  
The use of 3D printing technology reduces material waste and speeds up construction timelines. With precision layering, 3D-printed components use only the necessary materials, making construction leaner and greener.
- **Smart Energy Systems**  
Integrating renewable energy systems, such as solar panels and wind turbines, with IoT-enabled monitoring tools ensures buildings optimize energy use and minimize waste.





## Sustainable Practices in Construction

Eco-friendly construction isn't just about materials—it's about the methods and practices that shape a project from conception to completion.

- **Modular Construction**  
Prefabricated components built off-site reduce construction waste, energy use, and disruption to local ecosystems. Modular construction also allows for easy disassembly and reuse, promoting circular design.
- **Passive Design Strategies**  
Designing buildings that naturally maintain thermal comfort reduces reliance on mechanical heating and cooling. This includes orientation, natural ventilation, and the use of thermal mass materials.
- **Water Conservation Systems**  
Water recycling technologies, like greywater systems and rainwater harvesting, are becoming standard in sustainable buildings, addressing one of the most pressing environmental challenges.

## The Road Ahead

As sustainable construction technologies continue to evolve, the potential for creating environmentally conscious and energy-efficient buildings grows exponentially. These innovations aren't just trends—they're essential responses to the challenges posed by climate change and resource scarcity.

For architects, builders, and developers, embracing sustainable construction is more than an environmental responsibility—it's an opportunity to lead in a rapidly transforming industry. By adopting eco-friendly materials, leveraging advanced technologies, and implementing sustainable practices, we can build a future where the construction industry is part of the solution, not the problem.

# The Future of Assisted Living

The global conversation around sustainability often focuses on industries like construction, energy, and transport. Yet, one sector quietly reshaping its future through eco-conscious practices is assisted living. With a growing aging population and increasing environmental challenges, integrating sustainability into assisted living facilities is not just desirable—it's essential.

*Galston*

Alejandro Urena Sandoval - Farrell Rd



By aligning care for people with care for the planet, assisted living communities can create environments that are not only functional and supportive but also environmentally responsible. This balance ensures a better quality of life for residents while contributing to a more sustainable future.

## The Rising Demand for Sustainable Assisted Living

As the aging population continues to grow, so does the demand for assisted living facilities. According to the World Health Organization (WHO), the global population aged 60 and older is expected to double by 2050. With this surge comes a unique opportunity to embed sustainability into the design, construction, and operation of these facilities.

### Key Drivers:

- **Resident Expectations:** Today's seniors are increasingly aware of environmental issues and prefer eco-friendly options in their living arrangements.
- **Operational Cost Savings:** Energy-efficient systems and sustainable practices reduce utility bills, benefiting facility operators and residents alike.
- **Regulatory Compliance:** Governments worldwide are introducing stricter environmental regulations, making sustainability a non-negotiable for future developments.

## Sustainable Design Principles for Assisted Living

Modern assisted living facilities are embracing sustainability by adopting green building practices that align with the needs of their residents. Here are some design principles shaping the future:

### 1. Energy Efficiency

- **Solar Panels and Renewable Energy Sources:** Many facilities are incorporating solar panels, wind turbines, or geothermal systems to generate clean energy.
- **Smart HVAC Systems:** Advanced heating, ventilation, and air conditioning systems ensure comfort while minimizing energy consumption.

### 2. Water Management

- **Rainwater Harvesting:** Collecting and reusing rainwater for landscaping or non-potable purposes reduces reliance on municipal water supplies.
- **Water-Saving Fixtures:** Installing low-flow toilets, faucets, and showers lowers water usage without compromising functionality.





Bianca Gemmill - Aruma Ave



Brently Reid - Backyard Retreat

### 3. Sustainable Materials

- **Eco-Friendly Construction:** Using materials like recycled steel, low-carbon concrete, and sustainably sourced wood reduces the environmental impact.
- **Non-Toxic Interiors:** Paints, adhesives, and finishes with low volatile organic compounds (VOCs) contribute to healthier indoor air quality.

### 4. Biophilic Design

Incorporating natural elements like indoor gardens, water features, and large windows improves residents' mental health and well-being while enhancing energy efficiency through passive design.

○ **Eco-friendly facilities often provide healthier indoor environments,** thanks to improved air quality, natural light, and access to green spaces.

## The Role of Technology in Sustainable Assisted Living

Technology is playing a critical role in making assisted living facilities more sustainable and resident-friendly.

### Smart Building Systems

IoT devices allow for real-time monitoring of energy and water usage, ensuring optimal efficiency. Smart lighting systems adjust automatically based on natural light levels, reducing energy waste.

### Telehealth Integration

Reducing the need for transportation to healthcare facilities, telehealth services lower carbon emissions while improving access to care for residents.

### Mobility Solutions

Energy-efficient mobility aids, such as electric wheelchairs and scooters, powered by renewable energy sources, offer eco-friendly alternatives for residents.

## Benefits for Residents and Operators

Sustainability in assisted living benefits everyone involved—from operators to residents and their families.

### Enhanced Quality of Life

Eco-friendly facilities often provide healthier indoor environments, thanks to improved air quality, natural light, and access to green spaces. These features contribute to residents' physical and mental well-being.

### Cost Savings

Energy-efficient systems reduce utility bills, translating to lower operating costs for facility managers and potentially reduced fees for residents.

### Community Appeal

Sustainable practices attract eco-conscious families who value facilities that align with their environmental values.

### Challenges to Overcome

While the benefits are clear, integrating sustainability into assisted living is not without challenges.

- **Higher Initial Costs:** Sustainable designs often require a greater upfront investment, though long-term savings often outweigh these costs.
- **Retrofitting Existing Facilities:** Upgrading older buildings to meet modern green standards can be complex and costly.
- **Balancing Comfort with Efficiency:** Ensuring that sustainability measures don't compromise the comfort and care of residents is paramount.

## The Path Forward

As we face the dual pressures of a growing aging population and urgent environmental concerns, the integration of sustainability into assisted living is no longer optional. By adopting innovative designs, leveraging technology, and focusing on resource efficiency, assisted living facilities can become leaders in sustainable living.

Care for people and care for the planet are not mutually exclusive—they are interconnected. Sustainable assisted living offers a blueprint for a better future, one that provides comfort, dignity, and environmental stewardship for generations to come.

# Passive Roof Ventilation

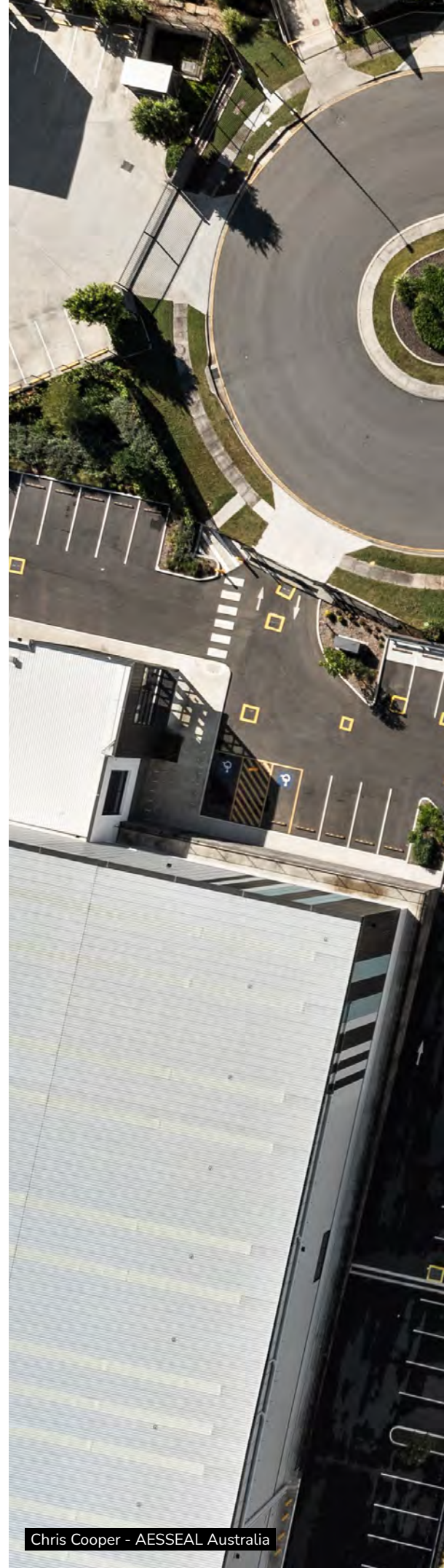
A NATURAL APPROACH TO  
COMFORTABLE LIVING

In an era where energy efficiency and sustainable living are paramount, passive roof ventilation emerges as an elegant, cost-effective solution. By leveraging natural airflows and temperature gradients, this approach not only enhances indoor comfort but also reduces energy consumption, making it a cornerstone of environmentally conscious building design.

## How Passive Roof Ventilation Works

Passive roof ventilation relies on basic physical principles: hot air rises, and cooler air naturally moves to replace it. Ventilation systems are strategically designed to facilitate this process. Air enters through intake vents, typically positioned at the roof's eaves or soffits, and exits through exhaust vents near the roof ridge or other high points.

This continuous cycle creates a convection loop, effectively removing hot air from the roof space and drawing in cooler air. Unlike active systems that require electricity to power fans or other mechanical components, passive roof ventilation works naturally, driven by temperature differences and wind dynamics.





## The Benefits of Passive Roof Ventilation

### 1. Enhanced Thermal Comfort

In hot climates, roof spaces can trap heat, significantly increasing indoor temperatures. Passive ventilation helps to expel this heat, reducing reliance on air conditioning systems and creating a cooler living environment.

### 2. Energy Efficiency

By minimizing the heat load on air conditioning systems, passive ventilation lowers energy consumption and reduces utility bills. This aligns with broader sustainability goals and supports efforts to lower a building's carbon footprint.

### 3. Moisture Control

In colder climates, passive roof ventilation prevents moisture buildup in the roof cavity. By expelling humid air, it reduces the risk of condensation, which can lead to mold growth, structural damage, and decreased insulation effectiveness.

### 4. Low Maintenance and Long Lifespan

With no moving parts, passive roof ventilation systems require minimal maintenance. High-quality vents made from durable materials can last for decades, making them a cost-effective investment for homeowners and builders.

## Design Considerations for Effective Ventilation

While the principles of passive roof ventilation are straightforward, achieving optimal performance requires careful design and planning:

- **Balanced Vent Placement**

Intake and exhaust vents must be positioned correctly to create a steady airflow. An imbalance can hinder ventilation efficiency.

- **Vent Size and Type**

The size and type of vents should be tailored to the roof's dimensions, the building's use, and the local climate. Popular options include ridge vents, gable vents, and roof turbines.

- **Wind and Climate Factors**

Local weather conditions, such as prevailing winds and temperature variations, play a significant role in the effectiveness of passive ventilation. Designing with these factors in mind ensures consistent airflow.

## Applications in Modern Design

Passive roof ventilation is adaptable to various building types, from residential homes to large commercial structures. In sustainable architecture, it often works in tandem with other passive design features, such as shading, thermal mass, and natural ventilation pathways.

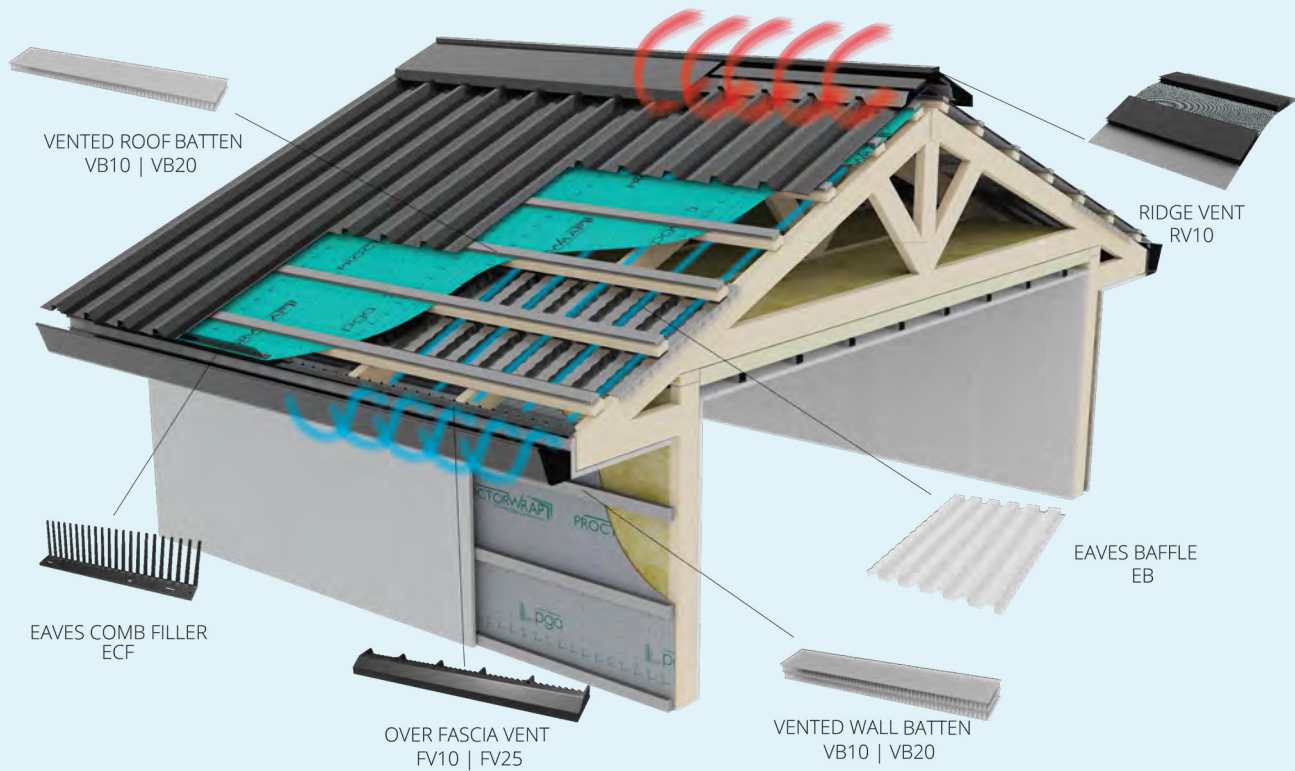
For example, green roofs, which are growing in popularity for their insulating properties, often integrate passive ventilation systems to optimize thermal performance and manage moisture levels. Similarly, homes designed with passive solar principles can use roof ventilation to maintain thermal balance throughout the year.

## A Sustainable Choice for the Future

As the building industry continues to prioritize energy efficiency and environmental stewardship, passive roof ventilation stands out as a simple yet highly effective solution. By harnessing natural forces, it provides a comfortable and healthy indoor environment while reducing energy demands and operational costs.

Incorporating passive roof ventilation into building design is more than just a practical decision—it's a step toward a greener, more sustainable future. Whether you're constructing a new home or retrofitting an existing structure, this approach offers lasting benefits for both people and the planet.





# Roof Ventilation Solutions

Get NCC2022 compliant with our passive roof ventilation solutions.

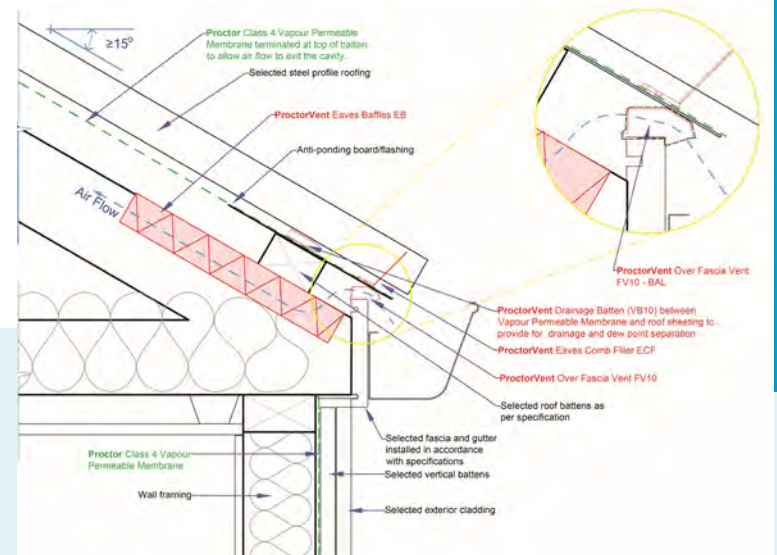
Proctor has developed tools and resources to simplify compliance with the National Construction Code (NCC) 2022: Vol 1 F8D5 / ABCB Housing Provisions Standard 10.8.3.

Our solutions are designed to help builders, architects, and contractors easily navigate the requirements set forth in the NCC, ensuring that roof ventilation systems meet or exceed the necessary standards for compliance, performance and condensation risk mitigation.



Helping you reach NCC compliance

Discover a variety of drawings showing our ProctorVent products in varied roof assemblies.



[proctorgroup.com.au](http://proctorgroup.com.au)

**PROCTOR**  
dctech



# Whole-of-Home Energy Efficiency Ratings

## WHAT'S NEXT FOR AUSTRALIAN STANDARDS?

Australia is on the brink of a transformative shift in how we assess and enhance the energy efficiency of our homes. With the expansion of the Nationwide House Energy Rating Scheme (NatHERS) to include existing homes, a new era of sustainability is dawning.

### The Evolution of NatHERS

Traditionally, NatHERS has provided energy efficiency ratings for new homes, guiding builders and buyers toward more sustainable choices. However, recognizing the vast number of existing homes that could benefit from energy improvements, the Australian Government has initiated an expansion of NatHERS to encompass these dwellings. This initiative aims to offer ratings for existing homes by mid-2025.

### Introducing the Residential Efficiency Scorecard

In the interim, homeowners can turn to the Residential Efficiency Scorecard—a tool that assesses a home's energy performance and provides tailored recommendations for improvement. This scorecard serves as a valuable resource, empowering homeowners to make informed decisions about enhancing their property's energy efficiency.

### Implications for Homeowners and Industry

The expansion of NatHERS signifies more than just a new rating system; it represents a commitment to a sustainable future. For homeowners, it offers a clear pathway to understanding and improving their home's energy performance, leading to reduced energy bills and increased comfort. For the building industry, it sets a higher standard, encouraging the adoption of energy-efficient practices and technologies.

- The expansion of
- NatHERS signifies more than just a new rating system;
- it represents a commitment to a sustainable future.

### Looking Ahead

As we approach the rollout of these expanded assessments, collaboration between government, industry, and homeowners will be crucial. By embracing these changes, Australia can move toward a more sustainable and energy-efficient housing landscape, benefiting both the environment and the community.

The forthcoming enhancements to Australia's energy efficiency rating systems mark a significant step forward. They promise to elevate the standard of living while contributing to the nation's sustainability goals—a win-win for all.

USE AN ABSA ACCREDITED

# THERMAL PERFORMANCE ASSESSOR

and Energise Tomorrow Through Today's Sustainable Building Designs



## Why Choose an ABSA Accredited Thermal Performance Assessor

The Leader in the Energy Assessor Accreditation Industry since 2006, ABSA is a part of the BDAA which is a nationally based not-for-profit member organisation that provides information, accreditation, support and advocacy for professionals to promote and foster building sustainability in Australia.

As one of its functions, ABSA accredits HERS assessors (also called Residential Building Thermal Performance assessors) under the Federal Government's Nationwide House Energy Rating Scheme (NatHERS) protocols. ABSA aims to provide all its members with a high level of professionalism and support. Why do we count accreditation as one of our chief functions and missions? Because the Australian government cares about accreditation. Homeowners care about accreditation. And, above all, our assessors care about accreditation.

As of 11 November 2019 all NatHERS Accredited Assessors must hold a Certificate IV in Home Energy Efficiency and Sustainability (Thermal Performance Assessment) (CPP41119). As the nation and world have come to realise that sustainability and thermal conservation are essential to the survival of the built environment, both designers and homeowners are insisting on more sustainable, ecoefficient designs. In order to expedite the accreditation process, ABSA has set out the steps that will need to be fulfilled in order to gain accreditation.

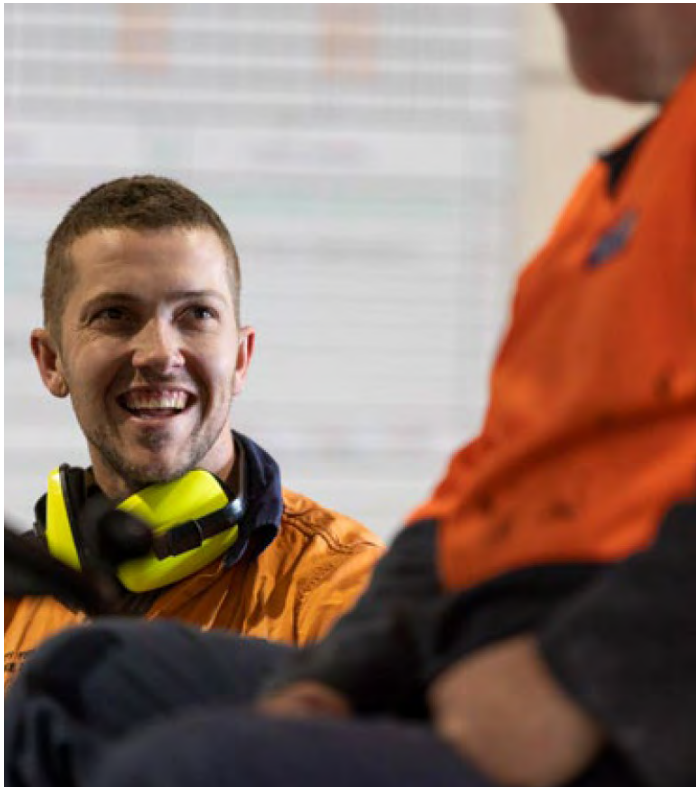
ABSA Accredited Assessors are recognised as the best in the industry undertaking regular auditing and continuous formal and informal training ensuring that the ABSA accredited assessors are held in the highest regard.



Let's work together  
to sustain and  
energise the future!

# A Commitment to Sustainable Excellence

At CRS, sustainability is more than just a strategic goal, it's an integral part of their corporate DNA. With a clear focus on reducing environmental impact, enhancing resource efficiency, and fostering a sustainable future, CRS has taken tangible steps to align its operations with global sustainability benchmarks.



## Innovative Initiatives for a Greener Future

CRS prioritises initiatives that address climate change, resource conservation, and operational efficiency. Their efforts include:

- **Energy Efficiency:** Investing in technologies and processes that reduce energy consumption across facilities.
- **Carbon Reduction:** Targeted strategies to achieve measurable decreases in greenhouse gas emissions, showcasing CRS's commitment to net-zero ambitions.
- **Circular Economy Practices:** Embracing waste reduction, recycling programs, and the use of sustainable materials to minimise environmental impact.

## Social Responsibility and Community Engagement

Beyond environmental initiatives, CRS upholds a strong sense of social responsibility, partnering with communities and stakeholders to drive positive outcomes. Their focus on employee wellbeing, community projects, and ethical governance underscores their holistic approach to sustainability.

## Measurable Progress

CRS's sustainability achievements are grounded in transparency and measurable outcomes. By consistently tracking progress and aligning with global sustainability frameworks, CRS ensures accountability while contributing to a more sustainable industry and planet.



CSR

# Building a better future.

Together our knowledge and inventiveness in building materials and design systems allows CSR to provide unrivalled expertise of how our products work together from wall to wall, roof to floor.



CEMINTEL®



## References

- Building a Culture of Sustainability - James Hardie  
[www.jameshardie.com.au/ContentfulCMS/Technical-Library/JH\\_Sustainability\\_Report.pdf](http://www.jameshardie.com.au/ContentfulCMS/Technical-Library/JH_Sustainability_Report.pdf)
- James Hardie Annual Sustainability Report  
[www.prnewswire.com/news-releases/james-hardie-releases-annual-sustainability-report-and-builds-a-culture-of-sustainability-302225555.html](http://www.prnewswire.com/news-releases/james-hardie-releases-annual-sustainability-report-and-builds-a-culture-of-sustainability-302225555.html)
- 2024 ESG and Sustainability Outlook for Australia - NetZero  
[nettzero.com.au/blog/2024-esg-and-sustainability-outlook-for-australian-businesses/](http://nettzero.com.au/blog/2024-esg-and-sustainability-outlook-for-australian-businesses/)
- Australia's ESG Landscape in 2024: Trends, Challenges, and Opportunities  
[www.leading-edge.global/blog/australias-australiasaustralia-esg-landscape-in-2024-trends-challenges-and-opportunities](http://www.leading-edge.global/blog/australias-australiasaustralia-esg-landscape-in-2024-trends-challenges-and-opportunities)
- Australia continues to lead on global ESG benchmarks  
[www.propertycouncil.com.au/media-releases/australia-continues-to-lead-on-global-esg-benchmarks](http://www.propertycouncil.com.au/media-releases/australia-continues-to-lead-on-global-esg-benchmarks)
- James Hardie Industries Releases First Global Sustainability Report  
[ir.jameshardie.com.au/news/press-releases/detail/38/james-hardie-industries-releases-first-global](http://ir.jameshardie.com.au/news/press-releases/detail/38/james-hardie-industries-releases-first-global)
- James Hardie releases annual Sustainability Report and 'Builds a ...  
[www.jameshardie.com/all-about-james-hardie/press-releases/performance/james-hardie-releases-annual-sustainability-report-2024/](http://www.jameshardie.com/all-about-james-hardie/press-releases/performance/james-hardie-releases-annual-sustainability-report-2024/)
- Sustainable Practices for a Better Future - James Hardie™ ESG  
[www.jameshardie.com.au/sustainability-esg-initiatives](http://www.jameshardie.com.au/sustainability-esg-initiatives)
- Sustainability is Built into our Strategy: James Hardie ESG Goals  
[www.jameshardie.com.au/blog/james-hardie-esg-goals](http://www.jameshardie.com.au/blog/james-hardie-esg-goals)
- James Hardie releases latest annual sustainability report detailing ...  
[www.jameshardie.com.au/blog/james-hardie-releases-fy2024-sustainability-report-highlighting-Australian-ESG-successes](http://www.jameshardie.com.au/blog/james-hardie-releases-fy2024-sustainability-report-highlighting-Australian-ESG-successes)
- Alejandro Urena Sandoval
- Bianca Gemmill
- Brently Reid
- Brian Heavin
- Chris Cooper
- Daniel Wedd
- Dylan Barber
- Frank Kosztelnik
- Graeme Bakker
- Jake French
- Jarrett Drake
- Joel Etherington
- Kirstie Wulf
- Martin Freney
- Peter Downes
- Samuel Kassis
- bdaa.com.au
- hafele.com.au
- hebel.com.au
- hed-consulting.com.au
- itiaustralia.com.au
- jameshardie.com.au
- lysaght.com
- nerotapware.com.au
- proctorgroup.com.au
- velocityhomelifts.com.au
- weathertex.com.au

Nero

